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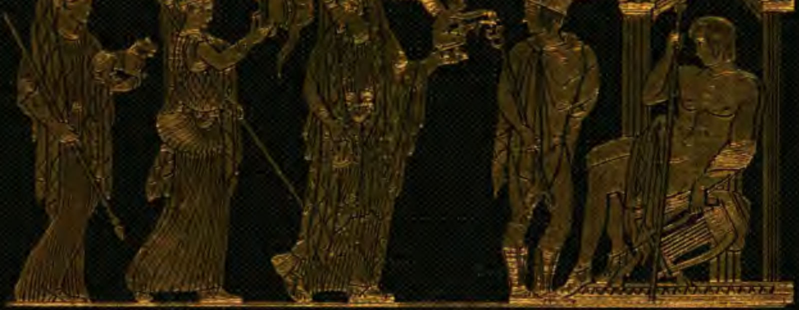

THE JUDGMENT OF PARIS

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THE JUDGMENT OF PARIS AND SOME OTHER LEGENDS ASTRONOMICALLY CONSIDERED

THE JUDGMENT OF PARIS

AND SOME OTHER LEGENDS ASTRONOMICALLY CONSIDERED

BY THE HON. EMMELINE M. PLUNKET

WITH ILLUSTRATIONS

UNIV. OF
CALIFORNIA

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THE JUDGMENT OF PARIS

I

INTRODUCTORY

WHETHER or not an historic basis for the Trojan war can be established, is a question still in dispute; but as regards the three goddesses who, contending against each other for the prize of beauty, were, according to classic story, the indirect cause of that war the case is different.

Only the most extreme adherents of the historic school will claim that Hera, Athena, and Aphrodite were Grecian dames, the fame of whose power, wisdom and beauty gained for them the high posts accorded to them in Grecian mythology.

But if we are not to think of them as historical personages, how are we to account for the first imagining of such divine beings as these three goddesses? What observations and what reflections first led men of old to establish them as powers only second in authority to Zeus, the supreme god of the universe?

Folk-lorists studying the customs and the superstitions of savage nations have arrived at the conclusion that a basis of "absolute irrationality" must be assigned to the mythological beliefs not only of the Greeks, but of all the civilised races of mankind, whether of ancient or of modern times.

There are many enquirers, however, who are not folk-lorists, and who hold the opinion that behind the beautiful but elusive legends of Greece and Rome, and even behind many of the terrible beliefs and superstitions of savage and semi-savage nations, traces of high scientific and ethical teachings may be discerned.

Of late years the revelations of archæology have assured us of the fact that arts and sciences flourished in Egypt and Babylonia at an age heretofore considered as prehistoric. Unless, therefore, we are prepared to deny to the Aryan race participation in the attainments of Semitic and Hamitic races, it is not unreasonable to suppose that Grecian and Roman legends—even though we should assign their origin to a far higher antiquity than that of the Homeric age—were not necessarily based on absolute irrationality, *i.e.*, on the speculations and observations of ignorant and savage men, but that there had been sufficient time and opportunity for them to have been imagined by sages of old, to exemplify scientific truths; and not only so, but that, further, there had been time for the original meaning of those myths to have become already, in the classic age, much obscured, even to the poets and dramatists who have handed them down to us. If this were the case, it is easy to understand how those myths, while they gained in beauty and in their truthful likeness to human nature, not seldom lost beyond recognition their likeness to the scientific truths they had been originally intended to exemplify.

Hieroglyphic symbols on the carved slates found in the tombs of the Pharaohs of the first dynasty seem to establish the fact that, as early as 4000 B.C., Egyptian astronomers had calculated the length of the year, and that festivals had been instituted to celebrate definite periods of time elapsed since the reigning Pharaoh came to the throne.

We possess in the British Museum, and have possessed for many years, tablets discovered in the library of Assurbanipal, who reigned at Nineveh from 668 to 626 B.C.—documents which purport to be copies of astrological works drawn up for Sargon of Agade, the first Semitic king who, so far as we know, held sway in Babylonia. The high date of 3800 B.C. has been claimed, on strong historic grounds, for this king, and the careful and systematic excavations of the mounds which cover the ancient city of Nippur have lately yielded corroboration of the probable accuracy of this date;[1] and even though we should adopt for Sargon the later date of 2800 B.C., proposed by F. C. Lehmann, still the high antiquity of astronomic observations in Babylonia must excite the interest and amazement of all enquirers into the history of science.

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[1] See *Explorations of Bible Lands during the Nineteenth Century*, by W. V. Hilprecht, pp. 388, 389, and elsewhere.

If now we assume that "the standard astrological work of the Babylonians and Assyrians was one consisting of 70 Tablets, drawn up for the library of Sargon of Agade,"[1] then, from a study of this work, it becomes clear that the Accadians — the pre-Sargonic inhabitants of Agade—followed a scientifically arranged lunisolar calendar; that they intercalated a month either in the middle or at the end of their years, and so kept themselves true to a fixed point on the ecliptic; and further, that there is strong evidence to show that "the Accadian calendar was arranged so as to suit the order of the Zodiacal Signs."[2]

I have in my book *Ancient Calendars and Constellations* called attention to this theory, and have based on it a corollary concerning the probable date of the origin of the Zodiacal year —namely, that of about 6000 B.C. Very briefly stated, the arguments in favour of 6000 B.C. for the origin of the Accadian calendar are as follows.

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[1] See *Transactions* of the Society of Biblical Archæology, 1874. Paper entitled "The Astronomy and Astrology of the Babylonians," Professor Sayce, p. 150.

[2] *Ibid.*, p. 237.

Some thirty years ago, or more, Assyriologists arrived at the opinion that the month names in the Accadian calendar showed a reference to the constellations of the Zodiac. They translated the names of the first three months as follows: first, "The Sacrifice of Righteousness"; second, "The Propitious Bull"; third, "The Twins." These names, it was pointed out, recalled to mind the three first constellations of the Zodiac, *i.e.*, the Ram, the Bull, the Twins: hence it was assumed that the first month of the year coincided with the passage of the sun through the constellation Aries; the second with its passage through the constellation Taurus; and so on through the constellations and the year. It was further assumed that in the Accadian, as in the later Babylonian calendar, the first month of the year arrived at the season of the spring equinox.

When, however, in the course of Assyriological research, it was established with almost certainty that the date of Sargon of Agade must be placed as high as 3800 B.C., it became apparent that if the calendar which obtained in Sargon's reign was Zodiacal, *i.e.*, if its first month coincided with the passage of the sun through the constellation Aries, it could not also have coincided with the season of the spring equinox; for, owing to a slow apparent movement of the celestial bodies, known as "the precession of the equinoxes," the relation of fixed stars to the seasons changes, and at Sargon's date the sun traversed the constellation Aries during a month which arrived two months earlier than the spring equinox, *i.e.*, one month later than the winter solstice.[1] It was felt, therefore, to be an anomaly that a calendar, so scientifically arranged as the Accadian, should deal with a year not beginning at any of the four well-marked seasons—midwinter, spring equinox, midsummer, or autumn equinox.

In a paper contributed to the *Proceedings* of the Society of Biblical Archæology, January 1892, I suggested that a possible way of accounting for this anomaly was to suppose that the Accadian calendar—which already at Sargon's date appeared to be a well-established and venerated institution—had been planned out some two thousand years earlier, at which date, *i.e.*, about 6000 B.C., *the winter solstice, and not the spring equinox*, coincided with the entry of the sun into the constellation Aries.

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[1] If the later date proposed by Lehmann be accepted, it would follow that the sun then entered Aries at the season midway between solstice and equinox.

After that paper had appeared in the *Proceedings* a further study of the Accadian month names strengthened, as it seemed to me, the probability of the supposition already put forward. The name of the twelfth Accadian month has been translated as "sowing of seed," and that of the thirteenth as "dark month of sowing."

There are, for countries situated in the temperate zone, two seasons of sowing seed. There is a spring sowing, and there is also a late autumn sowing, which in some instances may stretch on to the point of midwinter. Now the epithet "dark" cannot properly be applied to distinguish a thirteenth from a twelfth month in the spring, when each succeeding month is lighter, not darker, than the one which went before it.

The epithet "dark," on the other hand, does very well and graphically describe a midwinter month—a month in which it is almost too dark and cold to plough or sow. It is against such a ploughing that Hesiod thus warns the husbandman in his *Works and Days*, l. 479.

"But if at the point of midwinter you shall have ploughed the divine earth, you will have to sit and reap but little." It is perhaps to the thirteenth, the "dark month of sowing," that he refers at line 504, when he says: "But the month Lenæon (evil days all galling the oxen), this (month) avoid," etc.

Arguments drawn from the religious usages, and from the calendars of many nations, are not wanting in favour of a very early observance of the first degree of Aries as the original initial point of the Zodiac. The calendar at present in use in India resembles more closely the ancient Accadian than any other known to us, and in it the months—both the purely solar months observed in Malabar and Bengal, and the lunisolar months followed in other parts of India—are all counted as beginning theoretically when the sun arrives at the first degree of Aries; and it is at this point that "all schools of Hindu astronomy agree in declaring that the planetary motions commenced at the creation" (*Journal of the American Oriental Society*, vol. vi., p. 158).

I cannot claim that the view here put forward as to the solstitial origin of the Accadian calendar has been endorsed by Assyriologists; and it is true that some non-Assyriologists not only contend against the high date of 3800 B.C., or even against that of 2800 B.C., for Sargon of Agade, but that they also refuse to believe in the probability of the Zodiacal theory and the corollary based on it, namely, that the date of its origin was 6000 B.C.[1] The matter must, therefore, be considered as still under dispute, but to me the evidence in favour of a very ancient Zodiacal year appears so overwhelmingly strong—evidence derived not only from a study of cuneiform inscriptions, but from a consideration of the astronomy, the calendars, and the religious observances of many nations—that I cannot resist the temptation of following, and trying to persuade my readers to follow, the clue which is put into our hands by our acceptance of the theory of an ancient Zodiacal year. If the theory is true, the clue fastened to it may lead us—even though, otherwise, ill-prepared for the adventure—through labyrinths of uncertainties and speculations, and may enable us to make guesses as to the astronomical and calendrical ideas possibly underlying the legends of Greece and Rome, concerning the three goddesses, Athena, Aphrodite, and Hera.

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[1] Monthly Notices of the Royal Astronomical Society (March 1904). *Journal of the British Astronomical Association*, vol. xiv., No. 6. In reply—*Proceedings* of the Society of Biblical Archæology, January 1906. See Appendix.

On linguistic grounds, Max Müller was led to the belief that many of the myths of Aryan races were solar myths, based on the observations of the for ever recurring struggle of Light with Darkness.

The beauty of the dawn, the glories of sunrise, the triumph of fair weather over foul—such were the phenomena observed and (according to Max Müller) recorded in the names of their gods and goddesses, their heroes and heroines, by the myth-making ancestors of Greeks and Indians alike.

But if the teachings of Archæology have been rightly understood, and if we may now credit the races of mankind at a date as early as, and probably at a much earlier date than, 4000 B.C., not merely with admiring observations of the greatness and glory of the sun in his daily course across the heavens, but also with a close scientific observation of his yearly course through the stars —stars already mapped out into signs and constellations—we may go further than Max Müller, and may expect to find, not merely solar, but also astronomical and sidereal myths imbedded in the religions of all early races, not excluding those of the ancestors of the Greeks and Indians.

In accordance with this expectation we find the poet Aratos, to whom St Paul referred the people of Athens as an accepted exponent of Grecian belief, thus writing of Zeus:—

> ". . . . and of Zeus all stand in need.
> We are his off-spring: and he, mild to man,
> Gives favouring signs, and rouses us to toil,
> Calling to mind life's wants; when clods are best
> For plough and mattock; when the time is ripe
> For planting vines, and sowing seeds, he tells,
> Since he himself hath fixed in heaven these signs,
> The stars dividing; and, throughout the year,
> Stars he provides, to indicate to men
> The Season's course, that all things duly grow.
> Him, therefore, first and last, they aye appease.
> Hail, Sire, vast wonder, blessing to mankind!
> Hail, earlier race of men!"[1]

We here find Zeus, the supreme god of the

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[1] *The Phainomena or "Heavenly Display" of Aratos, done into English verse* by Robert Brown, Jun., F.S.A., l. 4.

Greeks, described as a Divine Father of mankind, presiding over the revolving year, and all its seasons—seasons marked by special stars.

We should, then, I think—as I have said already—expect to find in the Olympian circle, divinities presiding, but always in subordination to Zeus, over special seasons; and, further, to find that those seasons were, in some way, marked by special stars.

But the stars which when Aratos wrote indicated the seasons' course were not the same which in remote ages and for the "earlier race of men," hailed by the poet, "roused men to toil," and told "when clods were best for plough and mattock."

The slow, apparent movement of the celestial bodies, known to astronomers as the "precession of the equinoxes," produces a change in the relation of the stars to the seasons. In attempting to discover what seasons, marked by what stars, were presided over by particular divinities, our first task must be to choose some probable date at which the myths built on observations of the stars and of the "seasons' course" might have taken their rise.

It is to the very high date of 6000 B.C. that I have been led, as noted above, by many considerations to attribute the first fixing in heaven, "by some early race of men," of the Zodiacal constellations or signs; and it is in the relation at that date of those constellations to the seasons that, if the opinion I have arrived at is a just one, we may hope to find the basis of much of the imagery present in Greek and Roman legends.

But further we must keep well before our minds the thought of the importance attached, even at that early date, to the right counting of the year; and we must realise, what indeed the study of history teaches us, that correctly to adjust the relation of lunar months to solar years is a task requiring very high skill.

This task, if we accept the evidence of cuneiform tablets, had been successfully accomplished by the Accadians, or by the ancestors of the Accadians in prehistoric times; and by the Accadian calendar not only the Semitic inhabitants of Mesopotamia down to the beginning of our era, but also—or by one only differing from it in minor details—the Aryan inhabitants of India down to the present day count their Zodiacal lunisolar years beginning at the entry of the sun into the constellation Aries.

It is difficult, therefore, in the light of our present knowledge, to accept the claim made for Meton, the Athenian astronomer, that he, in the fifth century B.C., invented and *first* introduced into Greece the method of counting lunisolar years by means of a nineteen years' cycle. Not merely for centuries but for millenniums, as we now have reason to believe, in neighbouring countries lunisolar years had, by means of the due intercalation of months, been bound to the entry of the sun into the constellation Aries. And the astronomical fact must have become patent to all calendar keepers that at the end of every nineteen years the sun and moon together arrived within a fraction of a degree at the same point of the ecliptic at which they were in conjunction nineteen years earlier.[1]

It has seemed to me that in pursuing the astronomical consideration of Grecian and other legends the right understanding of the imagery of such legends must depend on our realising the positions of the sun and the moon amongst the constellations at the beginning and at the end of lunisolar years. I therefore give some diagrams[1] (to which in the course of our considerations reference can be made) to show how those positions vary during nineteen successive years; and also to show some of the different calendrical methods which may be followed in counting lunisolar years—years all bound theoretically to the entry of the sun into the constellation Aries.

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[1] Only after two hundred and nineteen years does this fractional difference amount by accumulation to one entire degree.

In all the diagrams in this book I have given the twelve equal divisions (dodecatemories) of the Zodiac as they appear in ancient Sanscrit astronomical works. In these the position of the initial point of the Zodiac is fixed at 9½ degrees to the west of that adopted for it by Hipparchus (150 B.C.). There is good reason to believe that before, and even after the date of Hipparchus, all Greek and Latin astronomers did not think of the first degree of Aries as coincident with the position of the sun at the spring equinox, but as being several degrees to the west of that position. From a study of a fragmentary papyrus lately discovered in Egypt, written in Greek, and attributed to the date 300 B.C.,[1] it is evident that the initial point of Aries was fixed some 14 or 15 degrees to the west of the equinoctial point. This position it held in the Indian sphere 500 B.C.

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[1] See Plates VIII., IX., X., at end of book.

According, however, to the deductions of the scholars, who have translated and expounded the cuneiform astronomical tablets belonging to the first and second centuries B.C., the position of the initial point of the Babylonian Zodiac was situated 4½ degrees to the west of that adopted by Hipparchus, and 5 degrees east of that appearing in Sanscrit works.

This element of uncertainty as to the initial point of the Zodiac necessarily entails an uncertainty, amounting to some centuries, in the dates which can be suggested for the *origin* of various astronomical myths; but it does not otherwise interfere with the speculations here put forward concerning those myths.

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[1] See Hibeh Papyri, 27.

II

ATHENA

If we admit the supposition put forward in the last chapter as to the existence in very ancient times, amongst many races, of the knowledge of a Zodiacally counted year, we shall expect to gain in discussing Grecian and classical legends valuable assistance by reference to the Accadian and to the Indian calendars, and very specially also by reference to those Ancient Indian Vedic myths which are, as I believe, closely connected with observations of the seasons, and of their relation to Zodiacal and extra-Zodiacal constellations.

It cannot for a moment be supposed that the Vedic, still less, that the Olympian deities were worshipped as abstract cosmical or astronomical beings and powers. The Grecian gods and goddesses, as we have learnt to know them, were very human in their attributes and actions. It is, indeed, a difficult matter to guess how far even the great epic and dramatic writers of classic times suspected an astronomical meaning in the legends they narrated. In these pages, however, it is only to these possibly underlying astronomic and calendrical motives that attention will be drawn.

Let us, therefore, now turn our minds to a consideration of the judgment of Paris, and attempt to divine what phenomena the goddesses who appealed to that judgment symbolised; and, in the first instance, what star-marked season of the year might have been thought of as specially presided over by Athena, the daughter and counsellor of Zeus.

According to Hesiod, Athena was the daughter of Zeus, and of his first consort, Metis—"most wise of deities as well as mortal men."[1]

The name Metis carries with it the meanings of Thought—Wisdom—Measurement. If, then, we think of Zeus as the supreme ruler and establisher of the year, and of Metis as a wise measurer, we may expect to find that Athena, the daughter of these two, should bear a direct relation to the skilful measurement of a year established by some high authority.

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[1] *Theog.*, l. 886.

At the birth of Athena, when the goddess sprang full grown and fully armed from the head of Zeus, we read in the Homeric hymn to Athena that "the glorious son of Hyperion stopped his fleet-footed steeds."[1] When we meet in ancient classic myths with the statement that the sun stopped his chariot, or that his steeds were stopped, we may, as a rule, suspect in this statement reference to either the winter or the summer solstice, for the word "solstice," which has come down to us from classic times, conveys the idea not merely of the sun standing still, but of the sun being made to stand still.

Hesiod describes Athena as "the glancing-eyed Tritonian maiden, having equal weight and prudent counsel with her sire,"[2] and again as "fierce, strife-stirring, army-leading, unsubdued, and awful, to whom dins and wars and battles are a delight."[3]

This description of the goddess, at whose birth the sun-god stopped his fleet-footed steeds,

[1] Homeric Hymn to Athena (xxviii. 13).

[2] *Theog.*, l. 895.

[3] *Ibid.*, l. 925.

accords with the stern midwinter season better than with that of midsummer; and Athena, therefore, presents herself to us as a divine being, connected in some manner with the measurement of years at the season of the winter solstice.

Now the thirteenth month, called in the Accadian calendar "the dark month of sowing," was the month by the intercalation of which the length of the Accadian lunisolar year was measured and kept true to the entry of the sun into the constellation Aries; and when the calendar, as I have claimed, was first originated, about 6000 B.C., the entry of the sun into Aries coincided with the season of the winter solstice.

These considerations seem to lead us to the thought that Athena, when the myths concerning her first took shape, was associated with that midwinter measuring month, and that she may, therefore, be considered as a lunar divinity; not, however, in the sense of symbolising the orb of the moon, but as a lunar divinity, in so far as she symbolised a definite portion of time measured out by skilful and scientific observations of the moon's course. Only a few comparatively late classical authorities[1] have attributed a lunar character to Athena. But the epithet "Tritonian," applied with such constant reiteration to the goddess, if it is studied in the light which can be thrown on it by Vedic and pre-Vedic legends, furnishes, as it seems to me, support to this opinion, and in so doing may open up a way to the right understanding of much astronomic imagery underlying Indian, Grecian and Roman mythology.

Grecian and Roman writers supply no really satisfactory information as to the meaning of this epithet "Tritonian." They tell us that the name, or epithet, was derived either from the fact that the lake Tritonis, situated either in the extreme West or in Libya, was the birthplace of Athena, or, on the other hand, that the goddess bore the name because she was the daughter of Poseidon and of Tritonis.[2]

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[1] W. H. Roscher, *Griechischen und Römischen Mythologie* (Mondgöttin, 3188). "Spät und, wie es scheint, lediglich gelehrter Spekulation entsprungen, ist die Gleichsetzung von Athena und Selene. Sie findet sich zuerst bei *Aristoteles* (?) fragm. 348b ed. *Didot=Arnob. nat.* 3, 31: *Aristoteles* (*Aristocles*?) *ut Granius memorat, Minervam esse Lunam probabilibus argumentis explicat et litterata auctoritate defendit*; vgl. *Et. M.* 767, 45."

[2] For several other explanations cf. Liddell and Scott under the word Τριτογένεια; also Farnell, "Cults of the Greek States," vol. i. pp. 266-270.

If, not satisfied with these vague and divergent suggestions concerning the word "Tritonian," we turn to the mythologies of Iranian and Indian races for possible illumination, we meet in the Zend Avesta with heroes named Thrita and Thrætona, and in the Rig Veda with a god named Trita; and for the most part scholars are agreed that these personages in both mythologies bear a close resemblance to each other.

The name Trita, according to Macdonell, "was felt to have the meaning of 'the third,'" and "phonetically corresponds to the Greek τρίτος." In the Rig Veda Trita appears as closely associated with Indra, the "favourite national god of the Vedic Indians," and he is spoken of as one "in whom all wisdom is centered." He, like Indra, fought against the snake-like demon Vritra, and, like him, he slew the three-headed Visvarupa. In many hymns he is described as with his ten fingers pressing out the Soma juice for Indra to drink. In one passage in the Rig Veda it is said that "Indra, animated by the sacrificial food, broke through the defences of Vala as did Trita through the coverings (of the well)." In Sanscrit literature, later than the Rig Veda, this allusion to Trita breaking through the "covering," or, as it is literally to be translated, "circular covering," is thus amplified.—"Three brothers, it is said, Ekata, Dvita and Trita, were travelling in a desert, and being distressed by thirst came to a well from which the youngest, Trita, drew water and gave it to his brothers; in requital they threw him into the well, and having covered the top with a cart wheel left him in the well. In this extremity he prayed to all the gods to extricate him, and by their favour he made his escape."

Macdonell points out that "corresponding to Trita, in the Avesta we find Thrita," and "Trita's slaughter of the three-headed, six-eyed demon or dragon," we find in the Avesta transferred to a cognate personage, Thrætona, who slays "the fiendish serpent, the three-mouthed, three-headed, six-eyed demon"; and this Thrætona, "in his expeditions against Dahaka, is accompanied by two brothers who seek to slay him on the way."

Before we begin to demand from this Indo-Iranian, and, as I believe, Eur-Iranian, legend that it should throw light on the epithet "Tritonian" applied to Athena, the fact must be frankly admitted that, as Macdonell says, "widely divergent opinions are held by scholars as to 'a large number of mythological questions.'" That this should be the case in dealing with so ancient a literature as is contained in Sanscrit writings, and especially in the Rig Vedas, is perhaps scarcely to be wondered at. I cannot but believe that one important factor which militates against the possibility of arriving at the true astronomic basis of many of these Vedic myths, is that the majority of scholars deny to the Aryan ancestors of the inhabitants of Iran and India the scientific knowledge possessed by the inhabitants of Egypt and Mesopotamia, and refuse to credit the Vedic "sages" with any but the most elementary acquaintance with astronomical phenomena; and that they therefore depose the greatest Vedic gods from the celestial sphere, and will only allow to them "atmospheric" or "terrestrial dominion."

But if, ranging ourselves on the side of the minority who admit for Sanscrit astronomical works the antiquity claimed for them by the Brahmans of India, we allow ourselves to attribute an ancient

Zodiacal calendar to India, and a knowledge of Zodiacal, and, therefore, in all probability, of extra-Zodiacal constellations to those who composed the Vedic hymns, we shall not be satisfied to think of Indra, the greatest god celebrated in the Rig Veda, as merely an atmospheric god, who, as his most renowned achievement, fought against and banished from heaven and earth the demon of drought and darkness, imaged as a cloud always of a snake-like form—a cloud unwilling to part with its waters till struck by the thunder-bolt of Indra.

We shall, instead, be inclined to seek in the Rig Veda for indications of Indra holding a higher post than that of an atmospheric god, and so seeking, it will not be difficult to recognise in him a god presiding over a definitely star-marked season of the year, namely, that of the summer solstice, so all-important in India, bringing with it, as it does, the rainy season. The defeat of the snake-like demon Vritra established the triumph of Indra and enabled him to release the streams pent up by the dragon. In this dragon we shall find not a mere cloud reluctant to part with its waters, but we shall recognise in it the far-reaching constellation Hydra, the water-snake. This constellation in ancient myth-making ages stretched its huge length for more than 90 degrees along the line of the equator, and only at the season of the summer solstice could it be utterly routed and in mythical language driven away from earth and heaven, that is, only then could the whole constellation be rendered invisible, for all night long its stars were below the horizon and by day they were extinguished by the sun's all-overpowering light.[1]

But if we give to Indra the rank of a celestial god we shall not refuse to Soma—a god almost as important as Indra, and one celebrated in many hymns as a dual divinity with him—the same rank. Rather we shall adopt the opinion—held by some modern and many ancient commentators — that "King Soma, the food of the gods, is the moon"; and in the hymns to Soma Pavamana, or Soma purified, which represents Soma as "surrounded by the waters," we shall easily see allusion to the full moon of the summer solstice, which—in those same myth-making days in which the Indra-Vritra legend took its rise—always appeared in the celestial waters of the constellation Pisces or Aquarius.

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[1] For the first imagining of the constellation Hydra and of the Indra-Vritra myth, I have, on astronomic grounds, claimed the date of "4000 B.C., or, to be more precise, of one or two hundred years earlier." *Ancient Calendars and Constellations*, p. 118.

If we adopt these astronomical interpretations for the gods Indra and Soma we shall not be able to refuse to Trita, "originally almost identified with Indra," a solstitial character, and as one who with his ten fingers prepares the Soma for Indra's drinking, we shall be inclined to think of him as of a lunar divinity.

The name Trita, as noted above, conveys the idea of "third." Grecian mythology suggests a threefold nature for some moon goddesses, and according to Grecian calendrical usage months were divided into three parts. The Roman Calends, Nones, and Ides, seem to show that originally Roman lunar months also were so divided. The cuneiform group which designates the moon god "Sin" is composed of the sign (𒌋), denoting the number "ten," repeated three times (𒌍). Now when we read of Trita as one of three brothers, and when we observe the constant allusion to the "ten fingers of Trita," the thought of a third part of some whole—that *third* part subdivided into ten—must almost irresistibly present itself to our minds.

In the Indian calendar "the lunar month invariably consists of thirty lunar days or tithis," and though at present Indian months "are divided into two equal parts,"[1] yet the Trita legend may well suggest that in remote Vedic times a threefold division was also made use of, and that each third of the month contained ten tithis.

Trita, preparing with his ten fingers the Soma for Indra's drinking, represented, I suggest, that third of the moon's course during which the moon attains its greatest brightness, and the legend of Trita in the well of water, imprisoned under a circular covering, resolves itself into a description of an eclipse of the full moon in the waters of Pisces or Aquarius—at the season of the summer solstice—temporarily darkened by the circular shadow of the earth, from under which shadow it emerges unhurt and unharmed.

I here reproduce a diagram (Plate I. See

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[1] *Times of India Calendar and Directory*, 1892, p. 14.

Ancient Calendars and Constellations, p. 174) originally designed to illustrate the Vedic Trita myth and to suggest the probable date of its origin. This diagram, to which reference will be again made later, may, I believe, help us to understand not only Vedic but also some Grecian mythic imagery.

Though Trita in the Rig Veda is closely associated with Indra, and is often spoken of with the added epithet "Aptya," meaning "of the waters" or "in the waters," and must therefore, as a Vedic divinity, be thought of as symbolising a part of the moon's course at the season of the *summer solstice*, we must not assume that only at that season were months divided into tithis, or into three equal parts: for, as I have said, the Indian months "invariably consist of thirty tithis," and we know that all the Grecian months were counted as consisting of three divisions.

I have claimed for Athena that she, the stern, unsubdued goddess, symbolised the intercalated thirteenth month of a Zodiacal year—a year whose beginning originally coincided with the winter solstice—and the epithet "Tritonian" applied to her can best be understood, I think, by supposing that

it referred to Athena as specially exalted during the brightest third of the moon's course, namely, during the ten lunar days, five before and five after the moment of full moon, at the season of the *winter solstice.* If we now so think of the *Tritonian Athena,* we shall not find much difficulty in understanding the imagery which gave to her as her constant adornment on helmet, shield, or breastplate, the terrible Gorgon's head.

Though in his *Lexicon of Mythology* Roscher maintains that the Gorgon represented a thundercloud, yet he admits that the generally held opinion is that the three Gorgon sisters represented lunar phenomena. This dreaded three, I now suggest, symbolised, when the Gorgon legend took its rise, the threefold phases of the moon; not, indeed, at all seasons of the year, but at that of midwinter, a season to which Hesiod applies the epithets of "severe" and "baneful." According to one version[1] of the Gorgon legend Athena fought with, and over-came, the Gorgon, and having cut off her head, possessed herself of it. This legend differentiates Athena from the Gorgon, and I would read it as depicting under the guise of the Gorgon sisters the threefold phases of the midwinter moon in ordinary years; and Athena, as presiding over the thirteenth month of an embolismic year, possessing herself of the terrible monster's head — the full moon of the mid-most month of winter.

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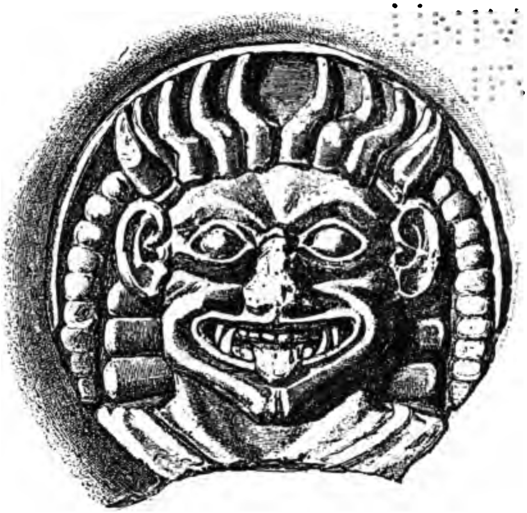
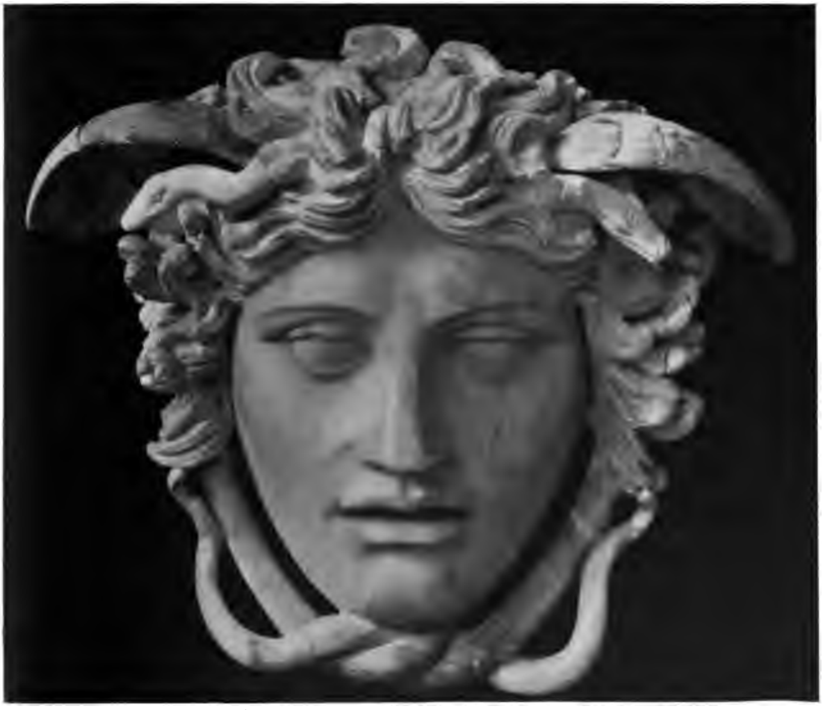
[1] The more usual legend is that Perseus killed the Gorgon, with the help of Athena. But there are authorities for the other version, *e.g.*, Euhemerus, in the Poet. Astron. of Hyginus, ii. 12, and Apollodorus, Bibl. 2. 4. 3. 8., who adds that some say the Gorgon challenged Athena to a contest of beauty.

The full moon of that month rides, as we know, higher in the sky than the full moon of any other season, and through the long hours of the longest night looks down in cruel loveliness on all beneath it; and, symbolised as the Gorgon's head, it might well have been imagined by poets and artists either as partaking of the grimness of the season, and therefore as hideous and boar-tusked, or, on the other hand, by those who sought to accentuate the surpassing brilliancy of the orb of the moon at that season, it could be imagined as of excelling but cold and repellent beauty. Under either aspect the dreaded form was credited with the power of turning into stone those who gazed on it — and this, in mythic language, describes, and scarcely

PLATE II.


Gorgon's Head, from Roscher's *Lexicon*, page 1716.


The Gorgon's Head, from the Glyptothek, Munich, No. 252.

[*To face page* 32.

with exaggeration, the freezing influence of the midwinter full moon on all life exposed to its rays.

The epithet "*glaucopis*" (bright-eyed), so constantly applied to Athena, still seems to insist upon this excelling brightness of the midwinter full moon. Creuzer points out that a classic poet called the moon "the dark eye of night,"[1] when comparing it with the sun, the bright eye of day; but this cannot forbid us to think that other poets, comparing one night with another, should speak of the long midwinter night, illumined by the moon of so excelling brilliance at its full, as *glaucopis*, or bright-eyed.

The legend which tells of Athena springing full grown and fully armed from the head of Zeus may find an astronomical explanation, if we think of the Tritonian maid as symbolising the course of the moon, not during the whole of the midwinter intercalary month, but specially during the ten mid-most days of that month.

In the Accadian calendar, during those ten days the sun must have always been close to the bright stars *α* and *β* Arietis, which mark for us the head of the constellation of the Ram. Zeus, as presiding over years originally counted as beginning at the entry of the sun into the constellation Aries, was occasionally represented adorned with ram's horns; and in fantastic astronomic legend the Tritonian Athena might have been thought of as brought into existence when the sun arrived at the head stars of Aries (see Plate XI.),[1] the earlier phases of the moon in that month being, as it were, swallowed up and forgotten in the glories of the birthday of the Tritonian goddess.

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[1] Euripides, *νυκτὸς ἀφεγγὲς βλέφαρον*, *Phænissæ*, 543.

There are in the Rig Veda a great number of joyous hymns to the twin heroes, the Aswins—in Sanscrit, Aswini. Now the first division of the Hindu lunar Zodiac is also named Aswini, and contains the stars α and β Arietis. The hymns to the Aswins were, I believe, hymns to be recited on the occasion of the new year's full-moon festival, and were addressed to these two stars, which were hailed as appearing at or before the dawn, and also as sometimes accompanying the sun, in years beginning, theoretically, at the sun's entry into the constellation Aries.[1]

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[1] At Plate XI. the longitude of the sun in the first and in the last months of twenty successive years is represented, and, as in Plate VIII., the new moon of the first months of these years is coincident with the sun's entry into the constellation Aries; or it is the new moon most closely following on that event. The difference to be observed in the position of the sun in the ecliptic in Plate XI. and in Plate VIII. is, that in Plate VIII. the months are represented as beginning and ending at the moment of new moon, and in Plate XI. they are represented as beginning and ending five lunar days after full moon, therefore ten lunar days before new moon.

If I am right in thinking that the Grecian myth concerning the birth of Athena, and the Vedic myth concerning the Aswin heroes accompanying the rising sun, both bore reference to the sun in the constellation Aries, it might at first sight appear to entail the contradiction that the same stars had been thought of in the Grecian myth as being in conjunction with the sun at the time of full moon, in the *thirteenth* month, and in the Vedic myth as being in conjunction with the sun at the time of full moon, in the *first* month.

But there is in reality no such contradiction entailed, for it is to be remembered that in calendars such as the Accadian and Hindu the position of the full moon in the *thirteenth* month of one year differs by only a fraction of a degree from the position of the full moon in the *first* month of some other year.[1]

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[1] *Ancient Calendars and Constellations*, p. 137.

The very differences to be observed between the character of the divinity honoured, as I have supposed, in the Grecian myth as presiding over the *thirteenth* month, and the character of those honoured in Vedic myth as presiding over the *first* month of lunisolar years, seem to confirm the suppositions here put forward.

The Grecian goddess is "fierce, strife-stirring, army-leading, unsubdued." She is the goddess presiding over the darkest moments of the year; but those moments are measured by the unalterable stars, and to all of whom she is the protectress, refuge, help, and healing are assured. For though during the dark month sacred to Athena the sun must touch the wintry solstitial point, yet always before the moon in that month attained to its full the sun's southward course must needs be arrested, and the new cosmical year have its beginning.

The hero Aswins, on the contrary, have no fierce battles to wage. The dark hours of the winter solstice for them are overpast. They are always and altogether beneficent deities, and their worshippers appeal confidently to the "wondrous" and "not untruthful Aswins for protection, help and healing, calling to mind in so doing their ancient exploits."

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[1] See Plates.

Now the imagery of the Grecian myth of Athena springing full armed from the head of Zeus, and that used in the Vedic hymns to the Aswins, seems to demand that when and where these myths were first imagined years should have been counted from the new moon *following* the sun's entrance into Aries;[1] and this, it would seem, was the method followed in the ancient Accadian calendar, and by the Semitic inhabitants of Mesopotamia down to the beginning of our era.

But the Hindu calendar of to-day counts the lunisolar year as beginning at the new moon most closely *preceding* the sun's entry into Aries.[2] These facts led me to the conclusion that a change of method must have been adopted by the ancestors of the Hindu race, after the imagery contained in the hymns to the Aswins, based on the older method, had taken shape.[1]

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[1] As in Plates I. and V.

[2] As shown in Plate III.

Great confusion prevails as to the calendrical methods followed by the various Greek states in historic times. It is not possible, therefore, to appeal to historic Greece for reliable information when comparing the course of Greek and Indian astronomic methods. But it has seemed to me possible to observe in some of the later Grecian legends—those referring not to the birth of Athena, but to the protection accorded by that goddess to Greek heroes in the Trojan war—that a change similar to that effected in the Hindu calendar had been adopted by the ancestors of the Grecian race, after the earlier and before the later legends concerning Athena had been imagined, and that for those later myth-makers the lunisolar year began, as for the modern Hindus it begins before, and not after, the entry of the sun into Aries.

It was probably an effort on the part of some ancient astronomers to keep the year true both to the constellation Aries and to the winter solstice that resulted in this reform—a reform that was, as I have suggested, carried out by a portion of the Aryan race.

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[1] *Ancient Calendars and Constellations*, p. 137 *et seq.*

Down to about 3800 B.C. the reformed method of counting the months would have ensured the possibility of the winter solstice occurring at intervals in the first month of the calendrical year, but, later than that date, it would no longer avail. The reform of the calendar should then, I think, be placed at some date not later than 3800 B.C.

All these speculations must appear to be founded, and, indeed, are founded on very uncertain data; but there is this to be said in their support, that the astronomic clue we are following leads us in the same direction, and to the same conclusion, as that arrived at by philologists for quite other reasons, namely, to the opinion that the ancestors of Greeks and Indians were not so far separated from each other, either by difference of language or geographical position, as to be unable to influence each other when many of their myths, based on the observation of physical phenomena, were still in the act of being welded.

Thinking of Athena as originally presiding over the "dark month of sowing," we may find astronomical explanations of the legend concerning Buzyges,[1] the Attic hero who first harnessed oxen to the plough. I would identify him with Bootes, the celestial ox-driver whom "men the ploughman call."[2]

At the date of 6000 B.C. the figure of Bootes marked symmetrically on the northern meridian at midnight the season of the winter solstice,[3] and at that date and that season, the almost terribly beautiful full moon of the dark month of sowing must at midnight have appeared on the same meridian as the figure of Bootes (see Plate III.). And though in much later classical times Bootes could no longer, symmetrically stretched along the northern meridian, announce the winter season, yet always the stars which mark the feet of the constellational figure of Bootes must have been in close proximity to the full moon of the intercalary (thirteenth) month. (Compare possible positions of full moon of thirteenth month as

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[1] Hesych., *s.v.*

[2] Aratos, *The Phainomena*, etc., l. 92.

[3] This consideration led me to conclude that we should attribute the first imagining of this figure to the same date as that of the institution of the Zodiacal Calendar (*Ancient Calendars and Constellations*, p. 223).

indicated by arrows in Plate III., and in Plates VIII., IX., X.)

This close connection of Bootes with the full moon symbolised by Athena may explain why to the priestly family, who claimed descent from Buzyges, was entrusted the care of the Palladium of the goddess, and why they also had charge of the plough and of the sacred oxen who three times a year were used in the ploughing festivals of Attica.

We cannot, as I have said, appeal to historic Greece for definite calendrical help in construing astronomical myths. One inevitable cause of the obscuration of the meaning of such myths is the change produced by "precession" in the relation of the fixed stars to the seasons.

Even if all the Grecian and Latin races had retained, as the Babylonians and Indians retained the knowledge of how to count by due intercalations accurately-measured, star-marked years, even so, the original motive of much of the imagery of ancient myths must already in historic times have become obsolete. The full moon of the month presided over by the "unsubdued and awful" Athena would in that later time have coincided more closely with the pleasant season of the spring equinox than with that of "severe" and "baneful" midwinter. But a further cause of mythical obscuration is to be found in the acknowledged confusion which prevailed both in Grecian and Latin calendrical methods. So keen an enquirer as Ideler has had again and again to confess himself baffled in the attempt to reconcile the conflicting statements made by classic authors as to such matters.

These considerations may mitigate the surprise which we must experience when we note that in Athens—so especially the home and centre of the worship of Athena—the year, at all events from Meton's date and onwards, began neither at midwinter nor in the spring, but close to midsummer.

But though we must therefore abandon the hope of gaining from the study of Grecian calendars elucidation of astronomic myths, yet here and there, in festival traditions and observances such as the above, we find ancient forms imbedded which may furnish to us, as fossils furnish to geologists, hints of what "the old order," now so changed, may have been.

Such a hint we may perhaps again obtain in studying the accounts of the greater and lesser Panathenæa festivals, which, according to some traditions, were established in Athens in prehistoric times by the mystic hero Erichthonius, and re-established there by the national hero Theseus.[1] Every year, we are told, the lesser were celebrated, and every fifth year with more imposing ceremony the greater festivals had their place. This practice pointed, I think, to the idea that the divinity who presided over the right measuring of years by means of an intercalated month, should in every year, indeed, be honoured; but that her highest festivals should be solemnised in those years when a thirteenth month was *actually* intercalated.

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[1] *Creuzer Symbolik*, vol. iii. pp. 470-471. "Vorzüglich sind hier die grösseren und die kleineren Panathenäen auszuzeichnen. Beide Feste hatten, wie fast alle Feste der Griechen, ihre Sagengeschichte. Die Parische Chronik giebt den Athenischen König Erichthonius als deren Stifter an; wonach ihr Anfang in das Jahr 1506 oder, nach Andern, 1521 vor Christi Geburt zu setzen wäre [S. die Parische Chronik Epoche 6 und 10, pp. 4 und 27 nach der Ausgabe von Wagner, vergl. Meursii Panathenäa (vol. vii., Thesaur. Antiqq. Graecc. Gronov.), cap. l. und Corsini Fasti Attici, tom. i. p. 30, tom. ii. p. 357, und tom. iii. p. 91 *sq.*]. Die kleineren Panathenäen wurden jährlich, die grösseren alle fünf Jahre gefeiert." At p. 473 Creuzer further states also that the national hero Theseus was "der Erneuerer der Panathenäen.'

To keep a lunisolar year true to a particular point on the ecliptic a month must be intercalated at intervals of two, or sometimes of three years; such months in the Accadian calendar were intercalated either in the middle or at the end of the year. The intercalation of a thirteenth month at the end of the year would, therefore, only occur, on an average, at intervals of somewhat over five years.

If we assume that in historical times the actual astronomic meaning of the Athena myths had been lost sight of, we can understand how unlikely it would have been that those who had the task of regulating Athenian festivals should have known how accurately to determine when the greater, and when the lesser festivals in honour of their goddess were due; and how it came about that, under these circumstances, in every fifth year an especially glorious celebration should have been established.

The Panathenæa festivals present other features which may receive astronomic interpretation. It has been claimed by some classical writers that the slaying of the Giant Aster (Asterios) by Athena was the incident commemorated in the (lesser) Panathenæa,[1] and that on the Peplus of the goddess, which was carried in ceremonial procession at that festival, the great achievements of Athena in the war of the Giants were embroidered.[2]

The name Aster or Asterios, as that of the giant triumphed over by the goddess, can scarcely fail to suggest the thought that some astronomical fact was symbolised by the imagery embroidered on the Peplus; and, according to the theory we are here following, this fact we may suppose to have been the occultation by the moon, at or near its full, of some very bright, conspicuous star.

Now it may be seen, by consulting and comparing Plates VIII., IX., X. and XI., that by whichever of the calendrical methods therein represented we suppose the year to have been counted, either on the night when the moon was at its full, or on the night before or on the night after that event, but always during one of the brightest nights of its Trita phase, the moon must have appeared in close proximity to the bright star Spica. This star is one of the first magnitude, and is especially conspicuous owing to the absence of any star near to it at all rivalling it in splendour. It is situated less than 5 degrees from the junction of the constellations Virgo and Libra, and is less than 2 degrees distant from the ecliptic. The "Tritonian" moon of the thirteenth month must, therefore, often have enfeebled its light, and in some years would absolutely occult the star itself, and thus the goddess could mythically have been represented as slaying the giant Asterios.

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[1] W. H. Roscher, *Griechischen und Römischen Mythologie*, p. 1650. "Athena tötete den Aster (Asterios), was nach *Schol. Aristid. Panath.*, 3, 323 *Dind.* (Vergl. *Arist.*, *vol.* v. p. 1574*a*, bk. xxi.), Veranlassung zur Feier der (kleinen) Panathenäen gab."

[2] *Ibid.*, p. 677. "Besonders populär war die Sage von Athenes Gigantenkampf in Athen, wie aus der Sitte erhellt, der Göttin an ihren Hauptfeste einen Peplos mit eingewebten Darstellungen der Gigantomachie darzubringen (*Eur. Hek.* 466*u*. *Schol. Verg. Ciris* 30).'

Creuzer mentions Greco-Roman calendars in which the Owl—the night bird sacred to Athena = Minerva—is represented close to the sign of the Fishes, and after it immediately follows that of the Ram; in these representations we may detect a reference to the full moon presiding over the *nights* of a month to be intercalated between the twelfth month, when the sun was in the sign of the Fishes, and the first month of the next year, when the sun would traverse the sign of the Ram.

The same writer draws attention to a Mosaic pavement, now in the Vatican, on which a half-length figure of Minerva is represented. In the band which surrounds this figure the moon, in different phases, is to be distinctly seen in eleven instances. A close inspection reveals an almost obliterated twelfth moon, and still there is space left for a thirteenth. In the photograph I possess of this pavement I cannot, however, discern traces of it. Stars form part of the decorations of the band.

This representation of Minerva, it can scarcely be denied, strengthens the opinion that she was thought of as a lunar goddess, and if we may assume a thirteenth moon in the Mosaic band, the idea that this goddess presided over an embolismic year would seem to be suggested.

We learn from Ovid[1] that the Roman festival to Minerva, the Quinquatrus, began on the 19th of March. At the date when Ovid wrote, the sun, on the 19th of March, arrived at a point on the ecliptic within 1 or 2 degrees of the junction of the constellations Pisces and Aries.

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[1] *Fasti*, iii. 809.

Thus, even in Rome, where we know that the calendar and its festivals had undergone many changes, and had been subject to much maladministration, we yet find the star-marked festival to Minerva held at the same time of the sidereal year at which—according to the theory here assumed—the full moon in the month sacred to the goddess would, many thousand years before, have shone down upon her votaries.

Athena in the *Iliad* and the *Odyssey* comes before us as the powerful protectress of the Grecian hosts, but more especially of Achilles and Odysseus.

I believe that we shall find much in a study of what is related in the Homeric poems concerning these heroes, and their dependence on Athena, that may suggest for these legends a calendrical basis. For the present let us return to our theme —"The Judgment of Paris"—and seek for an astronomical interpretation of the legends relating to Aphrodite and to Hera.

III

APHRODITE

IF now, granting the hypothesis concerning Athena discussed in the preceding chapter, we turn our minds to the laughter-loving Aphrodite—a goddess in every attribute and characteristic so opposed to her stern rival—the thought will easily suggest itself that we should not only claim for her relationship to the pleasant summer season of myrtles, of roses, and of all joyous emblems, but that we should attribute to her a more closely-defined astronomic position, namely, that of a moon goddess, presiding, like Athena, over an intercalated month—a month, however, not intercalated at the end, but in the middle of the calendrical year.

The question will then arise as to which method of counting Aries years the imagery of the Grecian Aphrodite myths points us to. The answer to this question, I think, must be in favour of the reformed calendar, having been the one followed by whatever race of people first evolved the imagery of those myths.

The full moon of the mid-year intercalated month, it will be seen according to that calendar, must always have appeared in the constellation Pisces (see Plate XII.), therefore in a portion of the heavens often mythically, I believe, imaged as the "fishy" or "monster-haunted sea"; for there not only do the Zodiacal fishes disport themselves, but also the Southern Fish and the huge sea-monster Cetus.

The Grecian goddess Aphrodite in the *Iliad* appears as the daughter of Zeus and Dione, who, according to some authorities, was an Oceanid.[1] We read how "fair Aphrodite," when wounded by Diomedes, won her way to Olympus and "fell upon Dione's knees that was her mother."[2] In the Homeric Hymn we are told that "Zephyr bare Aphrodite o'er the waves of the much-resounding sea on the soft foam."[3] The name Aphrodite itself contains the Greek word signifying "foam." The poet Bion calls the goddess a child of Zeus and the Sea,[1] and Grecian sculptors have represented Aphrodite in the arms of a female figure personifying the sea—a figure to which the name Thalassa has generally been accorded. Under the epithet "Anadyomene," Aphrodite is represented as rising from the sea.

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[1] Hesiod, *Theog.*, l. 353.

[2] Homer, *Iliad*, v. 370.

[3] Homeric Hymn to Aphrodite (vi. 3).

All this mythical imagery seems to point to the thought that if Aphrodite symbolised the goddess presiding over the mid-year intercalated month, it was in years counted from the new moon that preceded, and not that which followed, the entry of the sun into the constellation Aries.

We have already, at page 28, noted the fact that great honour was given in Vedic and pre-Vedic times to the full moon in the constellations Pisces and Aquarius during some of the many ages when that phenomenon marked the season of the summer solstice.

There are in the mythical and impassioned Vedic hymns addressed to Soma Pavamana many allusions to the "vase," the "pitcher," or the "cask," towards which Soma is said "to rush";

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[1] *Idyll*, x. 1.

and these allusions seem to point to a date about 3000 B.C., when the colure of the summer solstice passed through the vase of Aquarius.

But to the pre-Vedic legends concerning Soma (Avestan Haoma) and Trita (Avestan Thrita and Thrætona), a much higher antiquity must necessarily be attributed, and various considerations derived from the study of astronomic and of Indo-Iranian imagery[1] seem to point to the conclusion that the date of the *origin* of the Soma and Trita myths should be placed, on astronomic grounds, at the remote age of 4500 B.C. (see Plate I.).

At this date the full moon in Pisces, not in Aquarius, marked the season of the summer solstice, and that of the mid-year intercalated month.

Now if we come to the conclusion that European and Asiatic Aryans honoured and deified the full moon of the same season in the same constellation, and that there are ever so slight indications in the myths, built on that observance, of the same imagery and the same words having been used to describe that phenomenon, we shall scarcely be able to resist the conviction that at about the date 4500 B.C., the ancestors of those races now so widely separated, must have been within geographical and linguistic touch of each other.

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[1] *Ancient Calendars and Constellations*, p. 174.

An important point to note, in comparing and contrasting the way in which astronomic observations seem to have been dealt with in Vedic and Grecian mythology, must strike our attention, namely, that the deity symbolising the moon in Vedic mythology is a god, and in Grecian mythology a goddess; and side by side with this fact we may further note the linguistic difference in the practice of the Indian and Grecian races, which in the Sanscrit language makes the common noun "soma," signifying the "moon," masculine, and in the Grecian language the common noun "mene," signifying the "moon," feminine. I do not know whether scholars would attribute the mythologic difference to a linguistic cause, or the linguistic difference to a mythologic cause.

The husband allotted to Aphrodite was the lame, slow-footed Hephaistos; and in this description of the god we may recognise reference to the movement of the sun during the month presided over by the moon goddess Aphrodite. This month was intercalated, as we have assumed, at recurring intervals after the sixth month of the Zodiacal year, and during many ages coincided with the season of the summer solstice.

Slowly at that season of the year the sun climbs from the Eastern horizon to the meridian, and slowly does it again descend to the West. That in classic simile the movement of celestial bodies could be described as swift or slow-paced, in respect to the length of time occupied by them in accomplishing their journey across the visible heavens from East to West, we may learn from Virgil's lines[1] when he asks:—"Why do the winter suns make such haste to dip themselves in the ocean, or what delay retards the slow-paced nights?" As the long nights of winter are here described as "slow-paced," so, I think, the epithet "slow-footed" was mythically given to Hephaistos as symbolising the long midsummer days of the Aphrodite month.

In the great ingenuity and skill possessed by

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[1] Virg. *Geo.*, ii. 481.

Hephaistos we may, perhaps, note allusion to the care and skill required for the right adjustment of the intercalary month, just as in the name "Metis," the mother of Athena, the idea of skilful measurement seems to be suggested.

If the interval of five years between the high festivals held in honour of Athena bore reference, as we have supposed, to the interval, or to an approximation to the interval, between the recurring intercalations of the thirteenth month, so we may suppose the promise made by Aphrodite to Anchises—that after five years'[1] absence she would return to him, bringing their son Æneas with her—was suggested by the same calendrical motive, and referred to an every five or six years' intercalation of a mid-year month.

It would seem that not only is the goddess associated in the Grecian myths with the full-orbed moon of the midsummer month in the constellation Pisces, but that reference is also made in them to the moon in its earlier phases—in a month thought of under its ancient Ekata, Dvita, and Trita division. We may trace, in the representations of Aphrodite Pandemos, an allusion to the position of the moon at the *beginning* of the—Trita—third of her course. The goddess appears seated on a goat. On her head, which is partly veiled, she wears a rayed tiara, and several scattered stars are also depicted. Five lunar days before the moon attained to its full in Pisces, its disc, then more than half illuminated, would have been seen in the constellation Capricornus.[1]

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[1] Homeric Hymn, v. l. 276.

The opinion that the Trita portion of the moon's course contained five lunar days before, and five after, the moment of full moon, obliges us to think of the Ekata, or first portion of that course, as containing the ten lunar days preceding the moment of new moon. To consent to this opinion requires a difficult effort of the mind, for it seems much more natural to think of the waning days of the moon's course as being the *last*, and not the *first*, portion of a lunar month. But if once we yield to the conviction that the Sanscrit Ekata—the eldest of the three brothers Ekata, Dvita, and Trita—did indeed symbolise those waning lunar days, consideration of Grecian

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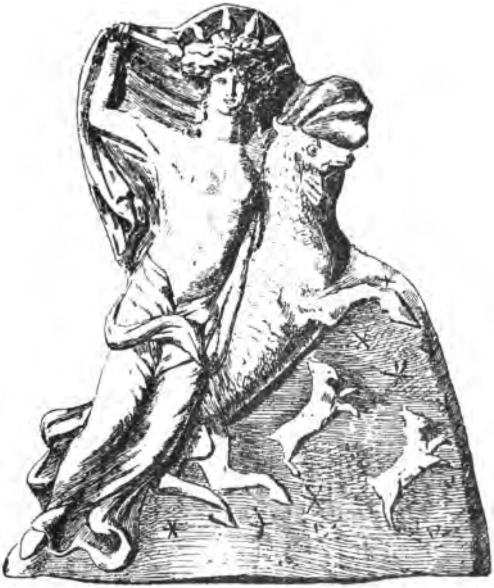
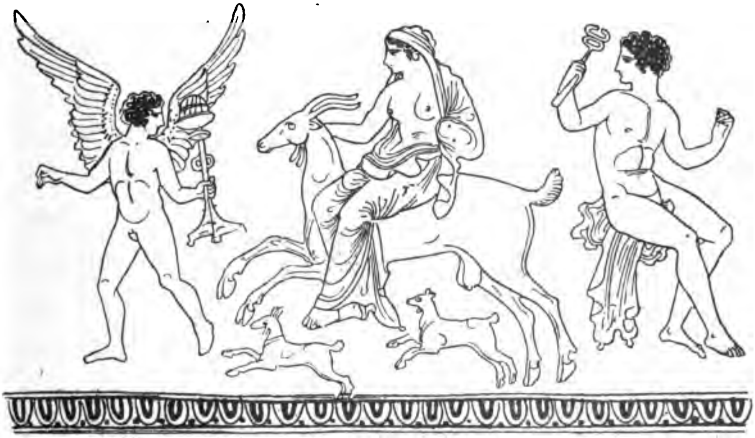
[1] See Plate I.

PLATE IV.



1) Aphrodite Pandemos, Terrakotta aus Theben (nach *Furtwängler*, *Sitzungsber. d. Bayr. Akad. d. Wiss. philos.-philol. Cl.* 1899, II p. 594).



2) Eros, Aphrodite auf dem Bock und Hermes, Vasenbild (nach *Arch. Jahrb.* 1889 S. 208).

Aphrodite Pandemos, from Roscher's *Lexicon*, page 1514.

[*To face page* 56.

and Roman calendrical usages may help to establish us in the opinion thus independently arrived at.

The numbering of the ten last days of Grecian months in decreasing order down to the day of new moon seems to point forward to the ensuing month instead of referring to the past twenty days of the then current month. The intricate Roman method of counting months by Calends, Nones, and Ides, can also, perhaps, best be explained on the supposition that in remote times the ancestors of the Romans, in counting their lunar months, paid special attention to the moon in its waning phase.

The character attributed to the Grecian goddess Hecate, whose name so easily recalls the Sanscrit Ekata, falls into line with these views.

Hesiod highly exalts Hecate, the daughter of Asteria and Perses, and declares that Zeus, "the son of Cronus," "did not take away from her as many honours as she had obtained by lot amongst the elder gods, the Titans, but she hath them as at the first the distribution was from the beginning."[1]

These words suggest a very remote origin for the Hecate myth, and seem to indicate that some change in the methods of counting time—such, it might well be, as that of a twofold in preference to a threefold division of the moon's course—had been adopted at some date later than the mythic ages attributed to the Wars of the Titans.

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[1] Cf. *The Classical Review*, vol. ix., p. 390.

Hesiod dwells at great length on the benefits bestowed by Hecate on those who strenuously contend for excellence in their various callings, and Van Lennep, quoted by J. Banks, whose translation of Hesiod I have used, writes as follows: "Because Hecate or Luna was deemed favourable to many pursuits and arts of men, and the night the best time for following them, she is here made the goddess of those who labour and follow various pursuits and the arts generally, though in the daytime." The passage in Hesiod is not difficult of explanation if—accepting the opinion that Hecate symbolised the Ekata phase of the moon's course—we realise when the crescent of the waxing, and when that of the waning moon may be seen.

In the restful evening hours the crescent of the waxing moon delights the eyes of many observers, when in the still glowing sunset sky it appears hastening to the western horizon; but with the waning moon the case is different. Only in the early morning time, when dawn is breaking in the East, may it show itself to those industrious ones who "scorn delights, and live laborious days," and who, rousing themselves to toil long before daylight, can observe the sickle-shaped moon rising morning after morning before the sun attains the horizon. The waning moon on its last morning of visibility so closely precedes the sun that it can be said technically to rise heliacally. The circumstance referred to in Roscher's *Lexikon*,[1] that "it was believed that Hecate invariably appeared before or at sunrise," strengthens the opinion that the goddess symbolised the Ekata portion of the moon's course; for it seems very clearly to point us to the appearance in the morning of the waning moon, and not, as the commentator suggests, "to the time of the rising of the new moon when it appears to come up from the underworld."

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[1] *Griechischen und Römischen Mythologie* (Hekate 1896), "Hierzu kommt der Umstand, dass man glaubte, Hekate erscheine unmittelbar vor oder bei Sonnenaufgang (*Apoll. Rh.* 3, 1223. *Vergil*, Æn. 6, 255; vgl. *Philoch.* b. *Athen.* 14, 53 S. 645 a. *Maneth. Apotel.* 5, 300ff. und oben B, I, b, 5), d. h. zur Zeit des Aufgangs des neuen Mondes, der eben aus der Unterwelt heraufzukommen schien."

I have dwelt on the Hecate myth, not because that gloomy goddess bore any likeness to the laughter-loving Aphrodite, but to support the theory of an ancient threefold division of months, the first division of such months containing the ten days preceding new moon.

Now there is one legend related by Hesiod concerning Aphrodite which seems to associate that goddess with the heliacal rising of a bright star, and, therefore, if we think of Aphrodite as at all symbolising the moon, this legend would necessarily refer us to the moon towards the close of its waning course or Ekata phase; for then, and then only, can the moon be said to rise heliacally.

From the Hesiodic legend we learn that Phaethon, the son of Cephalus and Eos, was made by Aphrodite in his early youth "her nightly temple-keeper, a divine genius."[1] Whatever difficulty there may be in determining what physical or astronomic fact was symbolised by Cephalus, the father of Phaethon, no doubt exists that the saffron-robed Eos symbolised the "Dawn," who goes "to high Olympus foretelling daylight to Zeus and all the immortals."[1]

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[1] Hes. *Theog.*, l. 990.

Phaethon — the shining one, the son of the Dawn — we may safely assume, was some star rising heliacally, and if we associate this star with an intercalated mid-year Zodiacal month, we are restricted to a certain number of specially bright or "shining ones," which at the Ekata portion of that month rose heliacally.

Now always when the waning moon at the close of the Ekata phase of an Aphrodite month showed its slender crescent for a brief space of time, then very near to that crescent the bright star Regulus might also have been observed. For Regulus, the star in the heart of the Lion (*cor Leonis*), must rise heliacally when the sun arrives at the eastern degrees of Leo; and it was in those degrees that the sun was situated in the closing days of the Ekata phase of the mid-year intercalated month (see Plates I. and XII.).

These considerations, if they stood alone, could scarcely be claimed as at all conclusively identifying the star Regulus with the hero Phaethon, for it is to be remembered that the association of Aphrodite with the mid-year season of the year is only hypothesis, and it might very reasonably be objected by those not disposed to adopt that hypothesis that other seasons of the year were equally well marked by the heliacal rising of other stars.

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[1] Homer, *Iliad*, ii. 48.

The proposed identification, however, of Regulus with Phaethon finds, I think, corroboration from a study of a varying and, as it is supposed, a later legend concerning Phaethon.

In this later legend Phaethon appears not as the son of Cephalus and Eos, but as the son of Helios, the sun god, and Clymene, an ocean nymph. The main features of this Phaethon story, which is indeed related with many varying and contradictory details, may be briefly summed up as follows.

Clymene was a daughter of Oceanus, and she urged her son Phaethon to seek out his father, Helios, and to claim from him acknowledgment of sonship, and, as a proof of it, permission to drive his chariot for one day. Phaethon went to the palace of Helios, and after long delay his father, with reluctance, granted his request; but the furious or inexperienced driving of the youth brought with it danger and fiery drought to the earth, till Zeus himself interfering, struck Phaethon with his thunderbolt. The chariot of Helios was stayed, its wheels torn off, and the wild and bewildered horses of the sun were turned back in their course.

The astronomical explanation I would suggest for this story is as follows. About 2300 B.C. the star Regulus marked the turning-points of the sun's course. At this date the sun at the winter solstice was in the constellation Aquarius, and at midwinter when the sun set Regulus rose, and all night long was visible above the horizon. In astronomical myths Regulus, as Phaethon, might then have been thought of as the offspring of Helios and of Clymene the Oceanid, Clymene representing some star or stars in the celestial waters of Aquarius.

But as the year rolled on, the sun, leaving the constellation Aquarius, continued its course through the Zodiacal signs, and Clymene the Oceanid was forsaken. Phaethon—the star Regulus—no longer rose just as the sun set, nor did it conspicuously shine during the whole night. Each night for a shorter space of time was it visible. At the spring equinox it was already on the meridian at sunset, and it was, therefore, only visible above the horizon for the first half of the night.

As the season advanced, always more closely did Regulus follow the sun, till at last it approached so closely to the "flaming Portals" of the West that it disappeared completely from mortal sight. These astronomic facts seem, quaintly enough, to have been embodied in the legend, and described under the image of Phaethon drawing near to the palace of his father Helios, there to entreat for the perilous honour of driving the chariot of the sun. The prayer of Phaethon was one which could not be refused, for a star situated as Regulus is close to the ecliptic, which at any given date was in opposition to the sun at the winter solstice, and rose as the sun set, must, at the summer solstice, rise at the same time as the sun. Hence, according to one version of the legend,[1] Helios yielded to the prayer of Phaethon, and father and son together mounted the chariot.

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[1] Euripides, *Phaethon*, Fragm. 771. Cited by Longinus, *De Sublimitate*, chap. xv. § 4.

Then, as the result of Phaethon's driving, we read of burning drought on the earth, of the threatened conflagration of the universe, of the interposition of Zeus, of the disaster to the sun's chariot, and of the stopping, and turning back of his coursers.

The burning drought and threatened conflagration suggest graphically the heat of midsummer; then, when the "blood of the Ethiopians was dried up," and "the territories of Libya were parched": while the intervention of Zeus, and the disaster to the sun's chariot, call to mind the astronomical phenomena of the solstice.

The word solstice, as has been stated above, conveys the idea not merely of the sun standing still, but of the sun being *made to stand* still. And that Zeus should have been the power to intervene, and thus to check the sun's course, accords well with the functions ascribed to him as ruler of the rolling year. It was Zeus also who, we are told in the legend, sent, according to some authors, in anger, or according to others, in mercy, a deluge which overspread the earth.

Now, in Egypt and Ethiopia, where some

authors place the scene of Phaethon's exploits, it is at the season of the summer solstice that the Nile overflows its banks and restores vegetation to the parched lands.

Granting that the story of Phaethon's disastrous course refers to the season of the summer solstice, it will be interesting to note the similarity of Grecian and Sanscrit imagery concerning this season of the year.

Indra, the highest god in the Vedic Pantheon, was, as I have endeavoured to maintain (pp. 13, 14), the god presiding over the summer solstice, and of him we read that he "tore a wheel off the sun's chariot," and that he "stopped his tawny coursers."

Thinking thus of Phaethon and his fierce driving of the chariot of Helios, as of the star Regulus at the season of the summer solstice in conjunction with the sun, we may find a more adequate basis for the legend than in those usually adopted—namely, that the disaster to the sun's chariot, and the fall of Phaethon, symbolised the phenomenon of sunset, recurring every evening; or the still vaguer suggestion that it symbolised the disappearance of the planet Venus as the morning star, previous to its reappearance as the evening star.

If we adopt the opinion that Phaethon is to be identified with the star Regulus, the two genealogies attributed to the hero, and the two legends, apparently so disconnected, recounted of him, can both, it will be seen, obtain an astronomical foundation: and thus we can understand how it is that, according to commentators, Hesiod could appear to adopt both genealogies for the hero Phaethon, and that Euripides also could skilfully have combined them (*sinnreich verschmolzen*) in a tragedy, of which only fragments now remain, and could have represented Aphrodite as the bride of Phaethon, who solved all difficulties, and consoled his parents by assuring them that to Phaethon had been granted a position in heaven amongst the stars.

I would now only further note that Phaethon, as the son of Eos, the dawn, *i.e.*, Regulus rising heliacally, in every age of the world's history announced, and still announces, the arrival of the sun at the eastern degrees of Leo: and that therefore at whatever date the legend of Aphrodite —as the mid-year intercalated month—was first imagined, Phaethon could have been thought of and imagined as the "nightly temple-keeper of the goddess, a divine genius."

The legend of Phaethon as the son of Helios and Clymene requires a more restricted date for its first imagining, namely, that at which the star in actual conjunction with, or exactly in opposition to, the sun marked the midwinter and the midsummer seasons, and this it might be said to have done for a hundred years or so before and after 2300 B.C. Only at about that date, therefore, could it have been recounted in mythic language that Phaethon and Helios together mounted the same chariot, and that then the great solstitial drama was enacted.

IV

HERA

HERA, "the sister and glorious wife of loud-resounding Zeus, whom all the gods through long Olympus venerating honour equally with thunder-rejoicing Zeus,"[1] though thus extolled in the Homeric Hymn, is not on her own account invested with much charm or glamour by the classic poets. It is as the wife of Zeus she is chiefly honoured by them. Her character or her exploits do not raise their enthusiasm.

In searching for a clue to the nature of the phenomena symbolised by Hera, it will, therefore, be well to fix our attention, in the first instance, on the functions and attributes of Zeus, and, studying them, endeavour to determine what astronomical truths are to be detected in the myths which tell of Metis, then of Themis, and finally of Hera, as having been in turn exalted to the high post of consort to Zeus.

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[1] Hymn xii. 3.

In these myths we may, I suggest, detect reference to calendrical changes necessitated by "precession," *i.e.*, the advance of the solstitial point through the constellations.

Of Metis, whom Zeus the king of gods first made his wife, we read in Hesiod.[1] And I would suggest that her function, namely that of measuring the star-marked year, devolved on her daughter Athena, when, according to the quaint legend, Zeus swallowed Metis, "that the goddess might indicate to him both good and bad."

"Bright Themis,"[2] whom next he wedded, the goddess of law, who with even hand holds the balance of justice, has often been associated with the constellation Libra, *i.e.*, the Balance or Scales. The moon of the first month of the Aries year at or near its full always shone in this constellation, and Themis could for this reason have been imagined as the consort of Zeus presiding thus over the first month of the Zodiacal year.

[1] Hes. *Theog.*, ll. 886-900.

[2] *Ibid.*, l. 901.

Themis on many coins and in ancient art is depicted as closely resembling Athena; and so, according to the astronomical interpretation of these myths, she might truly have been depicted, for, as we know, the full moon of the *first* month of one lunisolar year appears amongst the stars at a point less than a degree distant from where the full moon of the thirteenth month appeared in some other year.

Of Zeus, of Metis, and of Themis, we can think as presiding over star-marked years—years originally so marked, we may not but believe, to indicate "to men the seasons' course"; but neither the skill of Metis, "most wise of deities as well as mortal men," nor the great power of Zeus himself, could avail to bind the *season* to those stars.

As the ages rolled on, owing to precession, the solstitial point left the constellation Aries, and when, at last, even the compromise (see above, p. 38) by which calendar-makers had endeavoured to maintain an occasional coincidence of calendrical and solstitial years was no longer of any avail—when, in fact, the solstitial point had traversed the thirty degrees allotted to the constellation

Pisces, and had arrived at the eastern boundary of Aquarius—it must have become patent to all astronomers that there were two kinds of years of which they must take cognisance: one, an Aries year, established by authority in a, to them, already remote past, *i.e.*, about two thousand years earlier; and another, a seasonal year, beginning at the solstice when the sun was in the constellation Aquarius.

On the supposition (which may now, I think, be claimed as an historical fact) that astronomical observations and religious observances were very closely related to each other in ancient times, we can picture to ourselves the difficulties which must then have presented themselves to priestly astronomers, and the many diversities of opinion and practice which must have ensued.

The sacredness of the time-honoured observances connected with the beginning of the Aries year prevailed amongst many races. The Accadians, and following in their steps the Babylonians and Assyrians, remained true to the ancient, star-marked, Aries year. The inhabitants of India, as we have seen, still cling to the same observance.

But all races and nations did not follow the same constant course as regarded the beginning of the year.

The Iranian ancestors of the Medes and Persians seem to have entirely cut themselves adrift from all pre-existing conventions. They no longer counted their years as lunisolar, but simply as solar years, and these they established as beginning not at the winter solstice, but at the spring equinox.

Their mystic Tauric imagery seems to point clearly to the fact that this great reform was effected not later than 4000 B.C.[1]

A different course was followed by other nations. We read in Chinese history of an emperor Hoang-ti, in whose time the calendar was "*fort défectueux*,"[2] and of one of his successors, Tchuen-Hio, whose reign extended, according to the annalists, from

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[1] *Ancient Calendars and Constellations*, p. 76. The Tauric imagery of the Iranian ancestors of the Medes and Persians appears to have been influenced by observations of the irregular figures of the Zodiac, and these differ widely from each other in the extent they occupy in the sky. Babylonian and ancient Indian calculations, on the other hand, refer, as a rule, to the twelve equal divisions of the ecliptic (*dodecatemories*). In discussing the probable origin of Grecian myths I make reference to the equal divisions.

[2] P. de Mailla, *Histoire Générale de la Chine*, p. 232.

2510 to 2431 B.C. It is recorded that he carried out an important reform, and established the beginning of lunisolar years at a particular point in the constellation Aquarius, and (as he believed, permanently) at the winter solstice.[1]

In Babylonia we learn from an inscription carved on the statue of Gudea, the "priestly governor" of Lagash (2800 B.C.), that "on the day of the beginning of the year, the day of the festival of Bau, on which offerings were made," he made such and such offerings to the goddess Bau, who is described in the inscription as the beloved consort of Ningirsu (Ninib), the god of the southern sun, and of all the Babylonian pantheon the most honoured in Lagash.

Now Bau is a synonym of the great goddess "Gula," and Gula appears in the Accadian astrological and astronomical texts as the goddess presiding over the stars of the constellation Aquarius, in which constellation, at Gudea's date, the solstitial point was situated. From these facts we may safely gather that the rulers of Lagash followed a reformed calendar—one in which the year no longer began at the entry of the sun into Aries, but at the winter solstice—and that over this year Ninib and his beloved consort, Bau, presided.[1]

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[1] See *Ancient Calendars and Constellations*, p. 197 *et seq.*

The words of this inscription first suggested to my mind the idea that Zeus, as the ruler over a cosmical year, beginning at the winter solstice, might have been thought of, at some date later than 3800 B.C., as the consort of a goddess presiding over the constellation Aquarius—a goddess symbolising, as Grecian imagery may lead us to suppose, not the full moon, but the new moon in that constellation.

As stated at p. 42, great confusion prevails as to the calendrical methods followed by the various Grecian states in historical times. But we need not concern ourselves with questions as to the calendars of so late a period. All that is here suggested is that some of the remote ancestors of the Grecian race were acquainted with, and followed, a Zodiacal Aries year, but that at some date at or after 3800 B.C., they took note also of the fact that the solstitial or cosmic year began when the sun was in Aquarius, and that they attached high honour and importance to the conjunction of the sun and moon in that constellation as marking the beginning of that solstitial year.

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[1] *Ancient Calendars and Constellations*, p. 47 *et seq.*

The reformation of the calendar described in Chinese annals prosaically and historically, was similar to one, we may confidently infer from the inscription on Gudea's statue, which had been carried out in Lagash at a somewhat earlier date; and this reformation, as we have seen, influenced the religious ritual of the priestly rulers of Lagash.

Now it was the institution of just such a reformed calendar, I cannot but believe, which was poetically honoured by the ancestors of Greeks and Romans alike, under the mythical guise of the marriage of Zeus and Hera—of Jupiter and Juno.

The great pomp and circumstance of this marriage, when "last," as Hesiod[1] tells us, Zeus "made blooming Hera his spouse," was celebrated in many verses, and it was, above all others, the *sacred* marriage—the marriage of the gods.

We have thought of Athena and of Aphrodite as of goddesses symbolising the intercalary month at the beginning, and in the middle, of an Aries calendrical year, and more especially the third part of such months, during which the moon was in its brightest phase.

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[1] Hes. *Theog.*, l. 921.

But of Hera as the consort of Zeus, we are to think as of a moon goddess symbolising the season of the winter solstice, not so specially during the bright third of her course through the stars, but, on the contrary, at the time of new moon, when sun and moon were together in the constellation Aquarius. Some commentators claim that there is strong ground for the opinion that Hera and Juno in Greece and Rome were specially honoured at the time of new moon.[1]

It is related that Zeus carried away his bride to a lonely cave, and in this statement we may read astronomical allusion to the fact that the beginning of the solstitial year, symbolised by the marriage of Zeus and Hera, was fixed at the occurrence of *new moon*; for the darkness of a cave seems often to have symbolised the darkness of those nights when the moon was new. Milton has perpetuated this classical simile, when he compares the gloom of blindness to that which prevails when the moon

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[1] Roscher's *Lexicon der Griechischen und Römischen Mythologie*, column 2095.

> "deserts the night,
> Hid in her vacant interlunar cave."[1]

Pausanias[2] cites an Argive legend to the effect that Hera bathed once a year in the spring Canathus, at Nauplia, and so regained her virginity; and some writers suggest that this narration of the legend given by Pausanias can best be understood by supposing an annual festival in honour of Hera and her marriage with Zeus, at which the image of the goddess was bathed in the spring.

If we may understand the epithets "Aphrodite" and "Anadyomene" to refer to the appearance of *the moon at, or near, its full* at the season of mid-summer, in the waters of Pisces and Aquarius, so we may, I think, understand the significance of the legend symbolised by the ceremonial bathing of the image of Hera to refer to the yearly occurrence of the *new moon* (at the date when the myth was first imagined) at the midwinter season, in the waters of Aquarius. To the same phenomenon we may detect allusion in the Homeric statement

[1] *Sams. Ag.*, l. 88.

[2] Paus. II. xxxviii. 2.

that Oceanus, father of the gods, and mother Tethys, reared well and cherished Hera in their halls.[1] And again, in the differing Argive tradition, that the goddess was brought up by the three daughters of Asterion, the star-like river-god.[2]

The marriage of Zeus and Hera—of Jupiter and Juno—a legend originally built on an astronomical foundation, obtained, as we have seen, great mythological prominence. And this marriage came to be looked on, in classic times, as the type and pattern of all human marriages. Hera in Greece, and Juno in Italy, were especially invoked and honoured with many rites by brides on their wedding day.

Hera was also thought of as presiding over the birth and the up-bringing of children, and "Lucina" was the epithet by which, under this aspect, she was specially addressed. The word "Lucina" is said to be derived from the root Lux, meaning "light," and some ingenuity has been expended in attempting to explain the appropriateness of the epithet "Lucina" to the goddess, in her function of presiding over the birth of children.

An originally astronomical motive for the name may suggest itself, if we think of Lucina as presiding over the birth of a new year beginning at the winter solstice. Even in our own prosaic days the new year is, not infrequently, pictured as an infant, and if we turn to the ancient Vedic hymns, we may, I believe, find proof that the Aryans of India, at about the same date of the world's history, thought of the light of the sun as being an infant, born in the celestial waters of Aquarius at the season of the winter solstice.

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[1] Homer, *Iliad*, xiv. 201.

[2] Paus. II. xvii. 2.

There is a divine personage hymned in the Rig Veda under the name of Apam Napat—the son of the waters. He is described as a newly-born infant, "shining with bright rays amidst the waters," and as "gathering strength in the midst of the waters." This Apam Napat is identified with Agni,[1] the Vedic god of Fire, of earthly and atmospheric fire, but, as I believe, primarily as the fire of the sun; and under the title Apam Napat, especially the fire of the sun at the winter solstice, and in the celestial waters of Aquarius.

If we now think that Lucina was first honoured under that name, as presiding over the birth of a new year at the winter solstice, and bringing it from the darkness of winter into the ever-increasing brightness of the advancing season, it will furnish us with a more majestic origin for the epithet than those generally assigned to it.

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[1] *Ancient Calendars and Constellations*, p. 125 *et seq.*

A very marked characteristic of Hera is her fierce jealousy. It is a constant theme of classic authors, and though she be the queen of heaven, this her foible has furnished cause of contempt and mockery to many.

But if we consult the pages of ancient and modern history we shall be able to find many instances in which the wars and quarrels of race against race, and Church against Church, were marked and accentuated by differences of opinion as to calendrical observances. Noting these facts, and thinking of Hera as a deity presiding, in conjunction with Zeus, over cosmical years established by high authority as beginning at the *winter solstice*, we may be led to suspect an astronomical basis for the myths which tell us of the bitterness with which Hera persecuted her rivals.

Latona—or Night—was the mother of the archer-god Apollo and the archer-goddess Artemis.

No one will deny that the Grecian Artemis was a moon-goddess. The crescent moon, her constant adornment, proclaims this fact, while her bow and well-filled quiver point, as I believe, equally to the fact that she symbolised the waxing moon at its first quarter in the constellation of the Archer (Sagittarius), a phenomenon which, in remote mythic ages, *i.e.*, in round numbers, from 6000 down to 4000 B.C., announced the season of the *summer solstice.*

The first achievement of Apollo, the twin brother of Artemis, was the slaying of Python, the dreaded serpent—a deed which recalls the destruction and banishment from heaven and earth by Indra of the snake-like Vritra at the season of the summer solstice. This similarity of achievement may incline us to attribute the origin of the Apollo legend to the same date as that claimed for the Indra legend, *i.e.*, to a date somewhat earlier than 4000 B.C.[1]

If the claim that Artemis and Apollo symbolised the season of the summer solstice be granted, then Hera's jealousy of Latona, and her vain desire to postpone the night on which the crescent moon should appear in the constellation of the Archer, may be understood as poetically typifying the antagonism between the actual seasons of winter and summer; or it may be understood as indicative of the antagonism between the creeds and observances of races and nations who counted the year as beginning at one or the other of those seasons; or, again, between those who, though still following it may be the same calendrical usage, yet gave greater honour and greater sacrifices to the deities presiding over the season when the sun culminated in glory at midsummer, rather than to the deities presiding over the beginning of its upward course at midwinter.

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[1] *Ancient Calendars and Constellations*, pp. 118, 157, *et seq.*

Hera's cruel but unavailing persecution of Io may similarly receive astronomical interpretation. In Egypt, Io, after many wanderings, found rest and asylum, and there her son, Epaphus, was honoured and venerated. Epaphus, according to scholars, may be identified with the Apis Bull of Egypt, and now that the great antiquity of the knowledge of Zodiacal figures in Eastern lands is so well established, it is difficult to maintain that the worship of the Apis Bull in Egypt was merely an instance of animal worship, and not rather one of the worship of an animal symbolic of the celestial Bull (Taurus), the constellation which, from 4000 down to 2000 B.C., in conjunction with, or in opposition to, the sun, marked the season of the spring or of the autumn equinox.

It is generally held that the heliacal rising of Sirius determined the beginning of the calendrical year in Egypt, and about 3000 B.C. the heliacal rising of this star coincided with the summer solstice, and hence with the rising of the Nile—the most important factor in the prosperity of agriculture in all the surrounding country. The really spring-like and joyous season, however, of the Egyptian year arrives when the waters of the Nile have again returned to their natural channel, and vegetation spreads over the land. It was as presiding over this season of the autumnal equinox that we may assume that the god Apis was very specially honoured, for then it was that the constellation Taurus, rising at sunset, was visible all through the night.

We may, therefore, assume that the Io legend symbolised the antagonism of the creed held by the northern races—which honoured the seasons when the sun at midwinter turned in its course and began its upward journey—to the creed of those dwellers in Egypt who most highly honoured the, to them, joyous season of the autumnal equinox.

The Zodiacal clue which in this enquiry we have followed has led us to discuss possible astronomic explanations of the Grecian and Roman ideas concerning Athena, Aphrodite, and Hera, and the temptation is strong to advance still further along this line of enquiry, and to seek for indications which may throw light on the question whether Paris, the mortal hero who judged the rival claims of these goddesses, was also first imagined to personify some astronomic or calendrical fact, or whether he was some idealised historic personage, or simply a fanciful creation of the poets.

But here we enter on the debatable question as to the existence of an historic basis for the Trojan war.

A long-sustained struggle has been carried on over this question, and the balance of opinion regarding it still trembles from side to side. To take part in this struggle requires all the courage of a strong conviction—the conviction, namely, that scientific and calendrical observations played a more important part in the growth of ancient legends than that which till of late years it has been possible to assign to them.

Holding this conviction, I cannot but attempt to draw attention to some legends narrated concerning Paris, and certain Grecian heroes, which seem to contain astronomical allusions.

Further than this I may not venture to go. It is not impossible that in the course of time archæological, linguistic, and astronomical research may throw more light on the question as to how far an historic basis can be claimed for the siege of Troy, or whether we should look upon it as a mythical legend, based on observations of cosmic or calendrical phenomena.

For the present, notwithstanding the rapid advances which are being made all along the above-mentioned lines of enquiry, our knowledge of the great races of mankind, and of the different religious practices followed by those races in myth-making ages, is so imperfect that we cannot be surprised that the symbolism—if it is symbolism—contained in these myths should still remain incomprehensible to us.

Meanwhile, returning to our theme, "The Judgment of Paris," let us note that the goddesses, whose claims were submitted to the judgment of Paris, presided originally, according to the theory we are here working upon, over opposite seasons of the year. Athena and Hera over that of the winter solstice, and Aphrodite over that of the summer solstice.

V

PARIS

PARIS, I would suggest, personified in some way the spring equinox, and, as personifying the season midway between the summer and the winter solstice, might, according to mythic imagery, have been thought of as an umpire likely to award impartially the coveted apple to the goddess who rightly deserved it.

Paris is generally represented as a youth wearing Asiatic garments, and very specially a Phrygian cap; and this is enough to remind us of Mithras, the Persian god, who appears on so many monuments in Oriental garments and Phrygian cap, in the act of slaying a bull.

If we at all accept the presence, in any myths, of Zodiacal symbolism, it is impossible to refuse to these Mithraic monuments an astronomic significance, and not to see in them reference to the season of the vernal equinox, at a date when the equinoctial point was situated in the constellation Taurus.

Though no representation of Paris, so far as I know, shows him in the act of slaying a bull, many figure him in the company of bulls, and on the occasion of his first return to Troy, after his youth spent on the Idæan mountain, we learn that he contested for the possession of a special bull, and, securing it, triumphed over his brothers, and was acknowledged as the son of Priam and Hecuba, and henceforth honoured as a prince of the Trojan line.

The legend of Paris, and Mithraic symbolism, have other points in common.

On many Mithraic monuments the god is represented, at his birth, holding an upright, flaming torch in one hand. And a *torch*, we also read, was one of the symbols of the god.

Before the birth of Paris, Hecuba was warned, in a dream, that she was about to bring into the world a flaming torch. It was in consequence of this dream that Paris—his life, out of pity, being spared—was exposed on the mountain of Ida, and there grew up as a shepherd. When he, as a man, returned to Troy, there were those who remembered the ominous dream, and denounced him as "The Torch," destined to cause the destruction of Troy.

The name "Paris" is not Grecian. It is supposed to be a local name, probably of a Phrygian god or hero.

If we adopt the opinion that Paris symbolised the season of the vernal equinox, it lies rather to our hand to think that *equality* is the attribute emphasised in the name.

But the chief interest in the legend of Paris attaches to him as the Phrygian hero who carried away Helen, the wife of Menelaus, the Grecian prince, thereby embroiling Troy and Greece in long, disastrous war. We are, therefore, in a manner bound to attempt the difficult task of searching for some possible astronomical interpretation, however vague and incomplete it may be, and however prosaic it may appear to many, of this tragic legend.

To assist us in this task we must call to mind the propositions concerning the three goddesses already here discussed, and, for the sake of having an hypothesis on which to work, it will be necessary to assume that these propositions have been satisfactorily established.

We shall, then, picture to ourselves Athena and Hera, the deities who specially espoused the Grecian cause, as deities presiding, more or less definitely, over calendrical and cosmic years originally counted as beginning at the winter solstice.

Aphrodite, the friend and protectress of Troy and its allies, we shall think of as a goddess presiding over the midsummer season of the year. Artemis and Apollo we may also claim as deities symbolic of that season,[1] and favourable to the cause of Troy.

Advancing one step further, let us now assume that not only the *deities* favourable to Greece and Troy symbolised astronomic and calendrical facts, but that also the Grecian *princes and heroes* symbolised phenomena connected more or less closely with the winter season, and that Trojan *princes and heroes* were similarly connected with the summer season. For Paris we have claimed connection neither with the season of winter nor with that of summer, but with the spring equinox. He indeed appears as a prodigy, and as one inimical to both Troy and Greece.

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[1] *Ancient Calendars and Constellations*, p. 156, *et seq.*

If we follow this calendrical and astronomical train of thought, we shall find ourselves ready to fall in with the opinion held by many writers, ancient and modern, namely, that the Grecian princess Helen symbolised the moon. Such an opinion, however, does not lead us very far towards understanding the legend.

The moon, in the course of every year and every month, "plays many parts," and hence might appear mythically in many characters. For Helen, therefore, as for Athena, Hera, and Aphrodite, we must, by following classic legends, try to determine in what constellation of the Zodiac, at what season of the year, and at what phase of its course, the moon could have furnished the basis of the many tales of love and war that gather round the name of Helen of Troy.

We read of Helen that she was the sister of Castor and Pollux. Following the Zodiacal theory, this statement binds us very firmly to the opinion that the moon, symbolised by Helen, was the moon in the constellation Gemini. But in the course of each lunar month in every year, the moon sojourns for a time in that constellation. We must, therefore, again demand from the legend some further indication as to the season of the year marked by the moon in Gemini.

This indication the legend yields, by telling us that Helen was the wife of Menelaus, and our working hypothesis requires us to associate Menelaus in some way with the season of winter. We must, therefore, ask ourselves what phase of the moon in the constellation Gemini marked in the myth-making ages that season?

And here it must at once be confessed that neither as the new moon in conjunction with the sun, nor as the full moon in opposition to the sun, could the moon in the constellation Gemini have marked the midwinter season of the year.

But the moon at *its first quarter*, i.e., the moon with exactly half its disc illuminated, from about 6000 to 3800 B.C., marked in the constellation Gemini the winter solstice, in the same manner that in the constellation Sagittarius—the constellation exactly opposite to Gemini—it marked the summer solstice. And if we remember the high importance attached to the appearance of the moon at its first quarter in Sagittarius (see p. 82), and how this phenomenon was woven into the myths alike of Indians, Romans, and Grecians, we shall be prepared to accept without difficulty the possibility, or rather the probability, that the moon at its first quarter in Gemini should have been thought of and honoured by the same school of ancient astronomers as a mark of the winter solstice, or, more accurately perhaps, of the month in which that solstice then occurred, namely, the twelfth month of an Aries Zodiacal year.

The lunisolar twelfth month of such a year—counted according to the unreformed method—could have been, with some approach to accuracy, associated with the moon in its first quarter in Gemini. But I am rather inclined to think that the plan of marking a month by the appearance of the moon at that phase in a particular constellation was originally adopted to mark, not lunar, but purely solar months. A trained observer of the heavens might easily note at what degree of any particular constellation the moon appeared with half its disc illuminated, and could thence securely deduce the very day of the current solar month.

When the moon enters its first quarter the sun is then distant from it by one quarter of the ecliptic circle. When, therefore, it was observed at that phase in the first degree of Gemini, it would establish the fact that the sun was at the first degree of the constellation Pisces, and that it was the first day of the twelfth solar month of the year.

Throughout all the ages, since the twelve Zodiacal divisions of the ecliptic were first imagined down to the present day, the moon thus in its first quarter has marked, and still marks, the twelfth solar month of an Aries year.

Let us now, according to our hypothesis, assume that Menelaus typified such a twelfth month, and that Helen, the sister of Castor and Pollux, typified the moon at its first quarter in Gemini, and we shall be able to understand how Helen in the legend came to be associated by well-established observance, and as of right, with Menelaus.

Turning our attention now to Paris, and thinking of him as typifying the spring equinox, it might be considered enough to suggest, as an astronomical basis of that part of the legend which refers to his carrying away Helen from Menelaus, that at the same date of the world's history, when *the moon, at its first quarter* in Gemini, marked the solstice, *the new moon* in that constellation marked the spring equinox; and, therefore, that while some races and some schools of astronomy directed special honour to *the moon at its first quarter in Gemini as a mark of the winter solstice*, occurring in the twelfth month of the year, some other race, or some other school of astronomers, directed special honour to the *new moon in Gemini as a mark of the spring equinox.*

I am, however, both on historical and astronomical grounds, more inclined to place the origin of the story of Paris and Helen at some later date than 3700 B.C., when, owing to the changes wrought in the phenomena of the heavens by the precession of the seasons, the moon at "*new light*" in Gemini, and not the actual "*new moon*" in that constellation, marked the season of the spring equinox.

At 2600 B.C., the equinoctial point was situated in the constellation Taurus, about 15 degrees west of the constellation Gemini. When, therefore, at that date, and for some hundred years before and after that date, the sun was at the equinoctial point, the moon was new in Taurus, not Gemini. But on the evening when its slender crescent could first be observed as twilight deepened, it would appear, not in Taurus, but in the constellation Gemini, close to the bright stars Castor and Pollux, and all observers might then know that the season of the equinox had arrived.[1]

It is, then, astronomically and prosaically, as follows that I would translate the legend of the treacherous carrying away of Helen, the wife of the Grecian Menelaus, by Paris, the Phrygian prince.

Helen—the crescent half moon in Gemini—had, from about 4600 B.C., been associated with the twelfth month of the calendrical year, by some race who, originally, gave highest honour to the winter solstice, and counted their year as beginning at that season.

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[1] It was from "new light," as this first visibility of the moon is called, and not from the actual moment of "new moon," that the Babylonians, the Hebrews, and many other ancient nations, counted the beginning of their months.

Some other race, who had followed the teachings of a different astronomical school, and selected the season of the spring equinox as the one worthy of highest honour, at a date probably not earlier than 3000 B.C. chose the appearance of the slender, and exquisitely beautiful crescent moon at "first light," in the constellation Gemini, as a mark of that season.

In the worship and honour paid by opposed races to the moon, at different seasons, in its different phases in the constellation Gemini, we may thus find the basis of the legend which tells how the treachery of Paris caused bitter enmity between Greeks and Phrygians.

When Paris was dead, and when the Grecian hosts had triumphed over the Trojans, Menelaus again claimed Helen as his wife, and she again presided, high in honour, over the hospitalities of his palace. And we are told that for Menelaus himself, it was decreed by the gods that he should not suffer death, but should dwell for ever at ease in the Elysian fields, because he possessed as his wife the Zeus-descended Helen.[1]

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[1] Homer, *Odyssey*, iv. 561.

This serene sequel to the story of Helen and Menelaus we shall, then, account for, by supposing that the ancient and orthodox calendar was maintained by some European branch of the Aryan family; and this reading will further explain the version of the legend which we meet with in Herodotus,[1] and on which Euripides based his tragedy of *Helen.* According to it, the real Helen always remained faithful to Menelaus, and it was a phantom Helen who was carried away by Paris, and who, subduing the hearts of all beholders, was honoured in Troy as the wife of Paris.

This phantom Helen—this Eidolon—according to our hypothesis, we should recognise as the moon at "new light" in the constellation Gemini, marking for some heretical race the season of the spring equinox; while always, and throughout all ages, the moon at its first quarter, in that constellation, faithfully marked the twelfth month of the Zodiacal year.

As for the legend of the desertion of Œnone by Paris, when he, having left her on Mount Ida, sailed away to claim Helen as his wife, though it is not to be met with in the earlier classics, we may nevertheless accept it as having been based on an astronomic tradition, and it should, if so, be referred to the abandonment of the full moon in Sagittarius, as a mark of the vernal equinox, and the adoption in its stead of the moon at "new light" in Gemini for that office.

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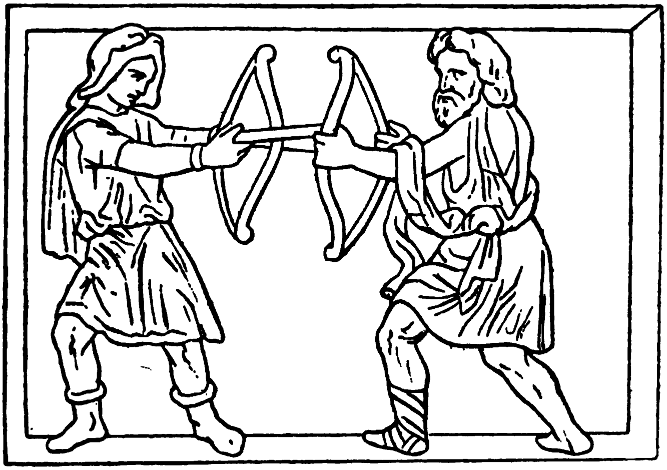
[1] Herod. ii. 113 *et seq.*

The death of Paris was caused by an arrow from the bow of Philoctetes.



15) Zweikampf zwischen Philoktetes und Paris
nach *Brunn*, *Rilievi d. urne etr.* Bd. 1 Taf. 72, 8).

The accompanying illustration, taken from a bas-relief on an Etruscan urn, represents the combat between the Trojan and the Grecian warriors.

The attitudes and equipment of the combatants are curiously alike, but Paris is youthful, Philoctetes wounded and aged. If Paris is to be thought of as symbolising the spring equinox, this illustration will easily suggest to us that Philoctetes may have symbolised the autumnal equinox—a season when triumph is awarded not to strength and vigour but to decay and approaching death.

It is further narrated by some authorities that when Paris had received his death-wound, he claimed an ancient promise made to him by Œnone, that she, who only could cure him of his wound, would come to his help. This promise, however, Œnone either would not, or could not, fulfil. According to one version of the legend she, instead, mocked at his anguish. It is possible to see in these legends reference to the fact, that from about 3800 down to about 1600 B.C., owing to precession, it was no longer the full moon in Sagittarius which marked the spring equinox, but the moon that came to its full in the baleful constellation of the Scorpion.

The story of Paris, then, unlike that of Menelaus, closes in disaster and dishonour. To Paris, dreaded even before his birth—the "Torch" that brought misfortune both to Trojans and Greeks, the Prince treacherous alike to Œnone and to Menelaus — poetical justice is sternly dealt out. We can almost feel as we read the legend that a certain animus has directed its course, an animus which may be explained, if we think of Paris as having typified the season of the spring equinox, and suppose that the sect which so honoured this season above others was hated and despised as one which practised a new-fangled and heretical cult.

VI

ACHILLES

THE first chord struck in the *Iliad*, and struck without any prelude, fixes our attention on the "wrath of Achilles, Peleus' son—the ruinous wrath that brought down on the Achæans woes innumerable," and we who are pursuing what to many will seem the invidious task of prosaically attempting to find astronomic interpretations of much that is recorded in the *Iliad* concerning Achilles, are bound, in the first instance, to seek for some astronomic fact which could have suggested the legend that tells of the moody withdrawal of Achilles from the ranks of war, and of how, at a time of great stress and danger to the Greeks, he remained hidden from their sight in his tent, and could not, by any entreaties, be induced to give them help.

As, according to our hypothesis, we have assumed that the Grecian heroes symbolised phenomena connected with the winter season, we might at first sight feel inclined to think of Achilles as symbolising the sun at the time of the winter solstice, withdrawing itself in the darkening days of that "severe" and "baneful" season from all beneficent offices during the often cloudy and always short days of midwinter. The epithet "swift-footed" so persistently applied to Achilles might further encourage us to rest contented with this opinion; for, as we have noted,[1] the winter suns are described by Virgil as making "haste" to dip themselves in the ocean, and the winter nights are described as "slow-paced."

This explanation does not, however, at all sufficiently cover the ground, or account for much that we should take into our consideration; for, first of all, we must remember that Achilles was more closely under the protection of Athena than was any other hero—excepting always Odysseus.

Now Athena presided over the Zodiacal Aries year, and though its beginning, as we have here assumed, originally coincided with the winter solstice, yet at the date to which the legend of the Trojan war may best astronomically be referred, namely, at about 2600 B.C., the Aries year began midway between the winter solstice and the spring equinox. We may not therefore rest content to explain the epithet "swift-footed," applied to Achilles, as referring to the rapid course of the sun above the horizon at midwinter, or to account for the story of Achilles' wrath and of his long brooding over the wrongs that Agamemnon had inflicted on him, by thinking of the midwinter sun gloomily withdrawing itself from human view.

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[1] *Ante*, p. 54.

To satisfy the requirements of the Achilles myth we must, then, set ourselves to seek for some celestial orb, other than that of the sun at midwinter, whose course across the heavens from east to west should have occupied so short a space of time as to have suggested and justified the epithet "swift-footed," so often applied in the poem to Achilles; and, further, we must seek for an orb which should have been withdrawn from human vision during the dark midwinter days and nights; and for one, moreover, whose longed-for reappearance in the skies should have been in some way connected with the measuring of a sidereal year (theoretically) beginning at the arrival of the sun at the first degree of Aries. The year, that is, which, according to our theory, was under the special guidance and protection of Athena.

Such an orb we may, I think, recognise in the bright star Fomalhaut, situated at the mouth of the Southern Fish (*Piscis Australis*). This star lies more than 20 degrees south of the ecliptic, and between the dates 3000 and 2000 B.C. it was in close proximity to the solstitial colure. It, therefore, accomplished its journey from the eastern to the western horizon in a considerably shorter time than did the midwinter sun in the same latitudes.

Moreover, at the midwinter season Fomalhaut, owing to its nearness to the sun, rose and set invisibly to human eyes. Somewhat more than two months before the winter solstice it might have been observed as a conspicuous evening star setting in the south-western skies, the sun then being in the constellation Sagittarius; but when in its yearly course the sun approached more closely in longitude to Fomalhaut, evening after evening for a shorter and shorter time could the star show itself. For more than three months it disappeared completely from view, and only when the sun attained to the first degree of Aries could Fomalhaut again be observed; not, indeed, as an evening star closely following in the sun's wake as it sank below the horizon, but now as a bright morning star rising (according to technical language) heliacally; that is appearing for a few brief minutes above the eastern horizon just before the sun's light extinguished that of all the other orbs of heaven.

Now, though I have claimed for the gods and goddesses favourable to the Grecian cause, and for the heroes under their protection, that they were closely associated with the season of the winter solstice, yet it must be borne in mind that they were not thought of as friendly to, or as enjoying the rigours of, that season, but that they were thought of as struggling with the powers of darkness, and as only then triumphing over them and introducing a brighter era, when the sun, having reached its lowest point, paused in its downward course and began again to assert its power and beneficence. In ancient Grecian and in ancient Sanscrit literature the character of winter is not exalted. Hesiod, as we have read, speaks of it as "severe" and 'baneful," and in the Yajur-Veda it is spoken of as the "distressed" portion of the year; and thus, it would seem, it was that poets could figure Fomalhaut, when they likened him to Achilles, as having been withdrawn from human sight at a time of utmost need and distress.

The third requirement for the orb that should have been symbolised as Achilles was a close connection with the measuring of an Aries year. Now it was, as above noted, only when the sun arrived at the first degree of the constellation Aries, about a month and a half after the winter solstice, that Fomalhaut, after its long absence from human vision, could have again been observed rising heliacally.

What has here been stated concerning Fomalhaut refers to that star as it was to be observed in Grecian latitudes at some date not later, and probably considerably earlier, than 2500 B.C. In Plate XIII.[1] the latitude 38 degrees N. is the one assumed; but if we place the origin of the legend as far north as 40 degrees N., *i.e.*, the latitude of Troy, it will be necessary to assume still earlier dates.

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[1] In this Plate circles of 13 degrees and of 10 degrees have been described, with the sun as their centre, in order to show how closely Fomalhaut followed the sun below the western horizon and became invisible in its rays in the ninth solar month of an Aries year, and

It is in thus realising the astronomical phenomena connected with the star Fomalhaut that I would seek to translate the legend of Achilles, who in his ruinous wrath withdrew from battle and brooded in his tent whilst severest distress oppressed the Grecian hosts; till at last, according to the irrevocable oath of Zeus—pledged by the awful bowing of his head—the Achæans did full honour to the son of Thetis, and he again appeared

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how, again, at the beginning of the first solar month it became visible as a morning star. According to some authorities the ancients counted the heliacal rising of a bright star as occurring when the sun was 10 degrees or 11 degrees below the horizon. The late Mr F. C. Penrose, in a paper published in the *Transactions of the Royal Society* in 1893, thus explains and discusses the meaning of the term "heliacal rising"; he says (p. 43), ". . . the meaning of the term being that the star, when very slightly above the horizon, should just be visible in the twilight, before being extinguished by the dawn." And, further, "The conclusion I have come to is that (1) a first magnitude star in fair average weather in Greece or Italy could be seen when rising heliacally at an altitude of 3 degrees, the sun being 10 degrees below the horizon; (2) that second magnitude stars should require an altitude of 3 degrees, with the sun 11 degrees depressed. . . ." To avoid a multiplicity of lines the 3 degrees for the altitude of the stars and the 10 degrees for the depression of the sun have been combined in a circle of 13 degrees.

in their midst, clothed and harnessed in fresh splendour, and heralded for the Grecian arms a new era of glorious triumph.

Nor need we, if we only call to our minds the importance attached in ancient times to such an event, think that we are doing any dispraise to Achilles by thus comparing his heroic acts to the heliacal rising of a star.

The heliacal rising of the star Sirius was, we know, in Egypt an annual occurrence of the first importance, and this importance was attached to it, not merely on account of its spectacular interest, but because it furnished a secure mark of the arrival of the sun at that part of the ecliptic from which the Egyptians desired to count their calendrical years; for the same reason, therefore, as that to which we have attributed the high mythical honour given to the heliacal rising of the star Fomalhaut.[1]

Twice in describing the terrible combat waged between Hector and Achilles, when at last "the great-hearted son of Peleus had made renouncement of his wrath," Homer in simile recalls the rising of stars in the darkness which precedes the dawn to enhance the glory of Achilles and the effulgence of his armour; for we read: "Him the old man Priam first beheld as he sped across the plain, blazing as the star that cometh forth at harvest-time, and plain seen his rays shine forth amid the host of stars in the darkness of night, the star whose name men call Orion's dog." And again: "As a star goeth among stars in the darkness of night, Hesperus, fairest of all stars set in heaven, so flashed there forth a light from the keen spear Achilles poised in his right hand, devising wrath against noble Hector."[1]

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[1] See Appendix, pp. 184-187.

It is perhaps possible that the legend of ancient acceptance, though not related by Homer, which tells of the combat waged between Memnon and Achilles, may refer to the rival claims of the stars Sirius and Fomalhaut to calendrical honour. Both these stars, by their heliacal rising at a particular time of the year, announced, according to different calendars, the beginning of a star-marked year.

Memnon and Achilles in the legend were represented as in many points equally matched. The goddess-mother of each hero anxiously watched the combat, and Memnon, when wounded to the death, as it appeared, was carried by Eos to Olympus, and to him Zeus accorded immortality.

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[1] The star Sirius and the planet Venus are both of them of much greater brilliancy than Fomalhaut. The poet, therefore, in these lines, exalts, as it were, the glory of Achilles.

To Phaethon, the son also of Eos, we may remember that according to Euripides the boon of immortality and a place amongst the stars was granted.

It is not without interest to note that the two sons of Eos, Phaethon and Memnon — if we admit their identifications with Regulus[1] and Sirius — symbolised stars which had this much in common with each other, that their heliacal rising coincided either in one or other latitude during many ages.

About 4000 B.C., in latitude 26, heliacal rising of Regulus and Sirius coincided.
About 3000 B.C., in latitude 32, heliacal rising of Regulus and Sirius coincided.
About 2000 B.C., in latitude 36, heliacal rising of Regulus and Sirius coincided.

Other considerations than that of their heliacal rising must, therefore, be taken account of when we attempt to determine how the legends concerning Phaethon and Memnon can be fitted respectively to Regulus and Sirius. As above suggested (p. 66), the different genealogies attributed to Phaethon point to the star Regulus. The close association of Memnon, "the King of the Ethiopians," according to Hesiod and many later classical writers, gives us reason to think of him as symbolising the star Sirius, whose heliacal rising was carefully observed by the ancient inhabitants of Egypt.

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[1] See *supra*, p. 61 *et seqq.*

Many incidents in the story of Achilles seem to enforce the opinion that as a whole it bore relation to some important calendrical observations such as may have resulted in the choice of the star Fomalhaut, as one which by its heliacal rising could conspicuously mark the arrival of the sun at the initial point of the Zodiac.

Achilles' father, Peleus, was the mortal hero best beloved by the gods; and Thetis, the mother of Achilles, was the immortal daughter of the ancient sea-god, Nereus. It was at the high ceremonial festival held in honour of the marriage of Peleus and Thetis that the fateful apple, indirectly the cause of the Trojan war, was flung by the goddess Discord amongst the assembled guests. This great wedding festival may remind us in its pompousness of that of Zeus and Hera, for which I have above (p. 76) claimed a calendrical import. The line of thought we are here following will incline us to attach a similar import to the marriage of the father and mother of Achilles, if we think of him as having symbolised the star Fomalhaut, and if we allow to him the important office of having announced the (theoretical) commencement of the Aries year.

It may not be easy to determine what definite astronomical fact was typified by Peleus, but the imagery connected with his adventures—prior to his marriage with Thetis—seems to point to that aquatic portion of the celestial sphere on which many marine monsters are portrayed; for Peleus was the brother, and also the slayer, of Phocus, and the name Phocus calls at once up to our minds the huge, seal-like constellation Cetus, the boundaries of which constellation adjoin those of Pisces, Aquarius, and of Piscis Australis.

The Nereid Thetis was the chiefest and most lovely of all the lovely sea-nymphs, and if there is anything astronomical in Grecian mythology we must place the sea-nymphs somewhere in the celestial waters of Pisces or Aquarius. The grouping of the stars in Aquarius furnishes one of the very few exceptions to the rule, that the constellational figures bear little, if any, resemblance to the creatures or objects after which they are named.

Of the many stars sprinkled over the sky in the vicinity of the vase in Aquarius Aratos says:—

> "And others scattered 'neath the *Waterpourer*
> In midst between the *Monster* and the *Fish*
> Are seen in ether, dim and nameless; near
> The right hand of the famous *Waterpourer*,
> Like a slight flow of water here and there
> Scattered around bright stars revolve but small.
> More clearly 'mid them move a pair of orbs,
> Nor very far away nor very near;
> One large and bright by both the *Pourer's* feet,
> The other 'neath the dusky *Monster's* tail,
> And all are called the *Water*."[1]

These stars may well, I think, by the myth-loving astronomers of old, have been imaged as the almost countless troop of sea-nymphs who in classic verse and art are represented as accompanying their sister Thetis, whether in her sad or joyous experiences.

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[1] *The Phainomena*, etc., ll. 389-399.

The gift of the Olympian divinities to Thetis was a golden vase, and reference to this vase is several times made in the Homeric poems. This inclines me to associate Thetis not with either of the "large and bright" stars alluded to by Aratos, but more probably with the star described in the Ptolemaic star list as "the foremost of those at the flow of the *Water* from the hand." This star, which on the Globe is distinguished by the name "Situla," (see Plate XIII.) at the date 3000 B.C. would have been specially noticeable as being then on the solstitial colure. Or, again, if the legend arose at a later date, α Aquarii or γ Aquarii—stars in the golden vase of the Waterbearer—may have been the star symbolised as Thetis. These three stars, it will be seen (Plate XIII.), are on longitudes not far distant from that on which Fomalhaut is situated.

Fomalhaut, the very bright star "close by the Pourer's feet," is by Aratos included amongst those "called the Water," but in most star catalogues it is included in the constellation Piscis Australis.

Its Arab name Fomalhaut signifies "The mouth of the Fish."

This star we are here identifying with Achilles, and we may, I think, trace in the imagery concerning Achilles reference to it, under both aspects, *i.e.*, as the brightest star in the stream or river which issues from the jar of Aquarius, and also as the brightest star in the constellation of the Southern Fish.

W. H. Roscher (one of the latest authorities on such subjects) in his *Lexicon* after many pages devoted to an enquiry into the legend of Achilles, concludes by expressing his firm conclusion that Achilles was originally a river-god.[1]

To connect in any way the fiery, impetuous Achilles with a fish may seem at first a more difficult task; but, that classic imagery could invest a fish with the qualities of a dangerous foe, we may learn from the descriptions of those Roman gladiatorial combats, in which one of the combatants, designated as " Mirmillo," and armed with helmet, shield, and sword, strove for his life against an adversary who as a Thracian (Threx) or a net-fighter (Retiarius) attacked him with a net and a trident.

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[1] *Ausführliches Lexikon der Griechischen und Römischen Mythologie.* Achilles, 66. "Ohne mich auf die Etymologie des Namens einzulassen, erkläre ich am Schlusse, dass mir nach den oben gemachten Zusammenstellungen von Mythen und Kulten die ursprüngliche Bedeutung des Achilleus als Flussgott unzweifelhaft zu sein scheint."

The description of this gladiatorial show throws, I think, still further light on the Achilles legend. The designation "Mirmillo," applied to this fiercely-fighting fish, suggests a possible derivation for the name of the warrior host that followed Achilles to the Trojan war. I have seen it stated that a change of sound from that of *d* to *l* is very usual in Italian languages.[1] Now if we suppose such a change to have taken place in the name "Myrmidon," we should obtain for the followers of Achilles a name very closely resembling that of the " Mirmillo," and this derivation would allow us to think of the Myrmidons not as of originally patient, toiling ants transformed into men, but as of mythical beings typifying stars in the celestial waters, and of their leader Achilles as of the brightest of those stars—the conspicuous star Fomalhaut.

[1] *Ausführliches Lexikon der Griechischen und Römischen Mythologie*, 650. Odysseus. " Schwerer wiegt aber ein anderes Bedenken: die Verwandlung des, wie man aus Homer zunächst schliessen möchte, älteren δ in λ. Den italischen Sprachen ist dieser Lautwandel von *d* zu *l* geläufig."

We read that Phœnix with his "heart's love" watched over Achilles in his early days, and that Cheiron instructed him in many arts, and more especially in that of healing. The bracketing together of Phœnix and Cheiron as playing so similar parts in the rearing of Achilles will easily suggest reference to the two closely adjacent constellations Aquila and Sagittarius, for the name Phœnix recalls the fabulous bird represented as resembling an eagle, and Cheiron, we are told, was placed by Zeus as a god in the constellation Sagittarius.

These constellations, when Fomalhaut surmounted the horizon, were in Grecian latitudes, and at the date 3000 B.C., on the meridian, and it is, therefore, perhaps possible to think of either or both of them as presiding lovingly over the youth of Achilles.

To some it may seem fanciful and far-fetched to think of stars and heavenly bodies as mythically associated with each other, in some instances because they were on the same meridian line, in other instances because they were exactly opposed to each other, or, as in this case, because one was on the line of the horizon and the other on the meridian at the same time. But Franz Boll has pointed out in his important work, *Sphæra*,[1] that it is only by being ready thus to associate the heavenly bodies with each other in all these different combinations that it is possible to arrive at all at the meaning of many astrological statements. We therefore may not unreasonably claim the same elasticity of meaning for mythical as for astrological expressions.

To Thetis it was revealed that for her son either a short life of imperishable fame before the walls of Troy, or a long and inglorious life in his native land had been decreed. Achilles chose imperishable fame, to which he indeed attained, and before the Grecians could enter Troy death overtook him.

A star rising heliacally appears above the horizon for but a brief interval of time before its fire is paled by the overpowering light of the sun. The appearance of the bright star Fomalhaut, thus rising, watched for and acclaimed by many as the auspicious mark of the beginning of the year, would seem to be contrasted in the legend with the career of the same star at any other season of the year.

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[1] "Die Sternbilder sind also offenbar in unsern Listen nicht bloss nach ihrem Aufgang, bezw. ihrer Länge, sondern zum Teil auch nach ihrer Kulmination, ihrem Untergang und ihrer Gegenkulmination verzeichnet." Chap. vi. p. 87.

Fomalhaut, 3000 B.C., was, as is above stated, close to the solstitial meridian, and might, even at that date, have been thought of as marking approximately the midsummer season. But if, as it is very possible, the legend of Achilles was still taking shape at a date as late as 2600 B.C., the star would then have marked accurately the four quarters of the year. At the season of the winter solstice it would have been on the meridian line at noon, invisible, indeed, to the bodily sight, but present to the mental vision of astronomers.

At sunrise and at sunset, at the spring and at the autumn equinox, it was similarly placed, and at the summer solstice it culminated at midnight. Nor was its visibility as it journeyed from the eastern to the western horizon at that season shortened either at its rising or its setting by the sun's light.

As a mark of the *cosmical year* the star

Fomalhaut, 2600 B.C., played a not unimportant part throughout the year.

But as the hero beloved by Athena we are to think of Achilles as connected with the Zodiacal *Aries year*, and therefore as symbolising Fomalhaut at the season of its heliacal rising, when by its brief but glorious appearance in the early dawn it announced the entry of the sun into the constellation Aries.

We have so far followed the story of Achilles according to Grecian myths, and in connection with Grecian affairs, and it has seemed possible to suggest a calendrical interpretation of that story; but when we come to his heroic exploits against the Trojan hosts and his slaying of Hector, we approach the great outstanding difficulty as to the historic or non-historic basis of the whole tale of Troy divine.

When we read of the founding of that high-gated, well-built city, and of the impiety of its powerful founder in refusing to compensate the great gods Poseidon and Apollo for the assistance they rendered to him in its building—when we read this and suchlike legends concerning the ancestors of Priam, it seems, I think, as if some great, mythologic chasm opened at our feet, as wide as that, it may be, which separates Indian and Grecian myths from each other. One important difference between these myths lies in the fact (noted at p. 53) that the Vedic gods and heroes appear often to have symbolised lunar phenomena, whilst the same phenomena in Grecian legends were represented by goddesses and heroines; a fact which, as we noted, may have resulted from, or may have been the cause of, a difference in the languages of the two races. The same difference as regards the gender of the sun and moon prevails to-day between the Teutonic and Latin races.

It may be that this same difference existed in prehistoric times between the languages used by the ancestors of Greeks and Trojans, and if this were so it would go far to account for the great difficulty in finding coherent and consistent astronomical explanations for those legends in which Grecian and Trojan heroes take a part.

If we adopt the opinion that Trojan heroes could be sometimes thought of as typifying the moon, the conflict between Achilles and Hector may resolve itself mythically into one between the star Fomalhaut, rising heliacally — heralding and closely accompanying the sun—and Hector, as the moon in the concluding days of a lunar month. During those days the sun, morning after morning, follows more and more closely, and appears as if in pursuit of, the waning moon. Finally, at "new moon" it overtakes the fugitive, after which event the moon no longer precedes, but, instead, appears to follow the sun.

Homer tells how Achilles three times chased the panic-stricken Hector round the walls of Troy, and then, having "devised foul entreatment" of the noble Hector, dragged his dead body after the wheels of his chariot.

In all this story, under the above suppositions, we may recognise Fomalhaut, in close proximity to the sun, morning after morning pursuing the waning moon; and of that waning moon—overtaken and vanquished, its darkened orb no longer visible—we shall think as of Hector, when "all in the dust lay his once fair head," the "foul entreatment devised" by Achilles against him having been accomplished.

It is true that in adopting this opinion and attempting to build on it still further astronomic interpretations, supposition must be perilously piled on supposition, but unless we are contented not to "climb at all," the inducements to advance along this perilous course are so many and so strong that they are not easily to be resisted.

In the first instance, then, under the supposition that Hector symbolised the moon in its waning phase, it may be possible to think of Patroclus, as of some star near to the ecliptic and also near to the same meridian line as Fomalhaut. Such a star would, like Fomalhaut, have been withdrawn from mortal sight during the darkest nights of winter, but would, some mornings earlier than Fomalhaut, emerge from that seclusion owing to its more northerly position; and the occultation of that star—lying within the Zodiacal belt—by the moon, some mornings before its waning crescent must itself disappear from the skies, furnished, we may suppose, the basis of the legend which told of the death of Patroclus and of the vengeance wreaked on his slayer by Achilles.

In Homer's account of this grievous combat between Achilles and Hector we read: "When the fourth time they reached the springs, then the Father hung his golden balances, and set therein two lots of dreary death, one of Achilles, one of horse-taming Hector, and held them in the midst and poised. Then Hector's fated day sank down and fell to the house of Hades."

Still following our astronomical clue, this description of the golden balances held in the midst and poised by Zeus will suggest to our minds allusions to the season of the Zodiacal year at which Fomalhaut rose heliacally. This heliacal rising—symbolised, as we have assumed, by the triumphant achievements of Achilles—synchronised with the entry of the sun into the constellation Aries, at which time Libra being in opposition was visible all night long, and was at midnight on the meridian line, and might thus well have suggested in mythical imagery the thought that "the Father hung his golden balance . . . and held them in the midst and poised."

In one other instance we read in the *Iliad* of Grecian and Trojan fates being weighed in the golden scales of Zeus. "When the sun bestrode mid-heaven, then did the Father balance his golden scales and put therein two fates of death that layeth men at their length, one for horse-taming Trojans, one for mail-clad Achæans, and he took the scale-yard by the midst and lifted it, and the Achæans' day of destiny sank down."

Now, if we strictly follow the chronology of the poem, we find that these two weighings in the scales of destiny of Trojan and Grecian fates, carrying with them as they did such utterly opposed results, took place one within a few days of the other. But to translate these two weighings astronomically we must abandon the thought of strict chronology in the poem, and think of the imagery as relating to opposed seasons of the calendrical year.

In the combat between Achilles and Hector the triumph is accorded to the Grecian side, and the season is that of the beginning of the Zodiacal Aries year—Libra is in *opposition*, and all night long the "Scales" are visible in the sky. In the combat described in Book VIII. the victory is to the Trojans, and the season is that at which the Scales are in *conjunction* with the sun; and so we read that when the sun bestrode mid-heaven—that is, at noontide—"then did the Father balance his golden scales," and the constellation Libra, invisible to human sight, attained, together with the sun, to the meridian at noon.

On the occasion of the so equal combat between Achilles and Memnon, referred to at p. 111, it is related, not by Homer, but by the poet Arctinos, that the fates of these two princes were also weighed in the scales. Here, again, as the triumph of Achilles is the theme of the poet, we can understand the imagery to be astronomical and to refer to the constellation Libra "poised" at midnight on the meridian line.

The death—on literary grounds, the somewhat unexpectedly inglorious death—of Achilles was occasioned by an arrow from the bow of the not too valiant Paris. The only astronomic motive for this incident that has occurred to me is that at the season of the spring equinox—as symbolised by Paris—Fomalhaut, as the sun rose, was already on the meridian; its *rising*, therefore, could not in any way have announced the approach of the sun to the eastern horizon, but rather did it announce that event by southing, or, as it were, *beginning to set.*

VII

ODYSSEUS

THE very pronounced contrast between the characters of Achilles and Odysseus—the two heroes so specially beloved and protected by Athena—cannot fail to present itself to the mind of those who for any reason set themselves to the study of the Homeric epics.

The crafty guile so characteristic of Odysseus is nowhere attributed to Achilles—a prince, not, indeed, patient like Odysseus in bearing woes, but sudden in his wrath and disdainful of compromise or deceit.

The epithet of "not untruthful," always in the Rig Vedas applied to the Aswin princes, could, we feel, be not inappropriately shared by Achilles; and if I have been right in endeavouring to maintain that the Aswins symbolised stars which by their heliacal rising announced a new year's full moon festival in Vedic times, and in claiming a similar symbolism for Achilles, it will be interesting to think of both Indian and Greek mythologies as embodying in the characters of their sidereal heroes the same underlying astronomical fact, namely, that of the steadfast and unalterable truthfulness and exactitude of star movements. There is no so permanent and *exact* unit of time as that measured by the revolutions of the stars; even the sun in comparison to them may be accused of lagging or of hastening its course.

But for Odysseus the quality of truthfulness was never, and could never, have been claimed. On the contrary, very often in the Homeric poems praise is given to him for very opposed qualities. We can in no way feel inclined to think of him as of a fixed and unchanging star. His nature and acts seem to partake rather of those of the ever-changing and inconstant moon.

Odysseus did not, I think, represent the moon, for the moon in Grecian language is feminine, and, as we have noted, in Grecian mythology it affords the basis for many legends concerning goddesses and heroines.

Let us think of Odysseus not as symbolising the moon, but the period of time included in a lunar month, and therefore as partaking of the apparently wandering and inconstant nature of the moon which governs such months; and if we further think of him as symbolising an especial lunar month, namely, the first lunar month of the Zodiacal Aries year—the year presided over by Athena—we shall be able to understand the curious passage in the *Odyssey* in which the goddess, having listened to a false tale devised by the quick and crafty wit of Odysseus, "smiled and caressed him with her hand," and congratulated him, claiming that he and she alike were "practised in deceits, for that thou," said Athena, "art of all men far the first in counsel and in discourse, and I in the company of all the gods win renown for my wit and wile." The wisdom of Athena, praised in the *Odyssey* as "crafty guile," was, according to our hypothesis, especially shown in her power of measuring out calendrical years; and if Odysseus represented the first month of such years, it is not difficult to understand how he could have been thought of as partaking of the wisdom of his patron goddess.

Looking at Plates VIII., IX., and X., we can see that the period included in a lunar month varies from year to year in its position amongst the stars, and it is matter of history that the adjusting of such months to the length of the solar year overtaxed the skill of calendar-makers in those countries where, as we must suppose, the method of counting them, as the ancient Accadians counted them, had been forgotten.

It is by keeping before our minds the apparent uncertainty and wandering character of a lunar month, and by also remembering the scientific accuracy with which in very ancient times the moon's course had been observed, that we shall be able to recognise and to admire the ingenuity and the beauty of the astronomic imagery which has given to us the picture of Odysseus as a wanderer, suffering many things and driven to practise many deceits, but yet as one under the firm protection of Athena, the daughter of Zeus and Metis—a wanderer who could not by any adverse powers be restrained from returning at the predicted time to his "god-like wife," "his own dear country," and to the full enjoyment of his sovereignty over it.

It was foretold by one who "excelled his peers in knowledge of birds, and in uttering words of fate," that Odysseus, "after sore affliction, with the loss of all his company, unknown to all, in the twentieth year"[1] should come home; and it is in the length of this period predicted for the wanderings of Odysseus, and in the exact fulfilment of the prediction, that the most convincing evidence of the lunisolar character of this mythic hero is forthcoming.

The cycle of nineteen years—the "Metonic cycle"—is, as pointed out above, one well known to historians and astronomers. It is an astronomic fact that at the end of nineteen years, *i.e.*, "in the twentieth year," the new moon falls again on the same day of the year. In lunisolar years, counted sidereally as beginning at the first degree of Aries, the actual and the theoretical New Year's day would, therefore, as a rule, coincide at intervals of nineteen years, and this return of the New Year's day to the first degree of Aries could, in mythical imagery, have very well been thought of as the return of Odysseus to his kingdom of Ithaca.

Granting that this may be the basis of the

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[1] Homer, *Odyss.*, ii. 174.

Odysseus legend, the question remains, which method of counting the Aries year was present to the mind of those who built up the legend? In other words, did they picture to themselves the first day of the first month, during the nineteen years symbolised by the wanderings of Odysseus, as occurring when the sun was in Aries or in Pisces? Looking at the diagram, and bearing in mind the Homeric account of those wanderings, we shall, I think, be inclined to the opinion that it was the later—the Hindu method as shown at Plate X., and not the Accadian method shown at Plate VIII.—which prompted the imagery of the Odysseus story, for we read that many were "the woes he (Odysseus) suffered in his heart upon the deep," and again, that it was Poseidon who "raged continually against god-like Odysseus."

According to the later method, the beginning of the Aries year would, as it appears in the diagram, have been tossed about during nineteen years in the monster-haunted sea wherein the Zodiacal fish have their abode; whereas, according to the earlier Accadian method, the beginning of the first month of the year would always have occurred when the sun was already in the constellation Aries.

But still further must we feel inclined to the opinion that the wanderings of Odysseus were thus thought of as taking place when the sun was in the constellation Pisces, if we turn our minds to the final stage of his journeyings, and read the wonderful legend which tells of the reception of the hero by Alcinous, who ruled over the mythical island inhabited by the Phæacians.

When Odysseus—after suffering the worst extremities of shipwreck, and being washed off from his raft—for two days and nights had been wandering in the swell of the sea, he came "in his swimming over against the mouth of a fair flowing river."

This river meeting the sea may suggest to our minds the junction of the constellations Aquarius and Pisces, where the river flowing from the vase of Aquarius touches the "fishy" or monster-haunted sea of the constellation Pisces. Close to that point the intercalary thirteenth month began, which by its intervention—after nineteen years of wandering—secured the return of the calendrical new year to the first degree of Aries.

Now Alcinous says: "Behold there are twelve glorious princes who rule among this people and bear sway, and I myself am the thirteenth." It is this Alcinous who speeds Odysseus on his way and sends him in a swift ship, rowed by two-and-fifty noble youths, to the shores of Ithaca, and "so when the star came up that is brightest of all, and goes ever heralding the light of early Dawn, even then did the sea-faring ship draw nigh the island."

Here we easily, I think, recognise calendrical imagery. In Alcinous, the thirteenth glorious prince, we see the thirteenth month which by its due intercalation binds the lunar to the solar year, and in the fifty-two noble youths we see the fifty-two weeks which so closely correspond in length to that of the solar year; while the bright star which heralded the light of early dawn and the near approach of the ship to the island of Ithaca, may remind us of the heliacal rising of the bright star Fomalhaut which, as I have claimed, announced the arrival of the sun at the first degree of Aries, and which at the end of a cycle of nineteen years announced the meeting, at that point of the ecliptic, of the sun and the new moon on the first day of the calendrical year.

Thinking of Odysseus as the first month of an Aries year, and studying the diagrams which show that there are several methods by which such years could be, and have been, counted, we may further be inclined to read an astronomical interpretation into the account given in the 23rd book of the *Iliad* of the funeral games instituted by Achilles in honour of his friend Patroclus.

On this occasion, so equal was the contest between the greater Ajax and Odysseus in the wrestling match, that Achilles could not decide between their claims to the prize; and in the race between the lesser Ajax and Odysseus, the rivalry was again so close that Odysseus could not have prevailed over his antagonist had he not cried to Athena to be "a good helper to his feet."

Reading of these competitors so equally matched, the calendrical thought may occur to our minds that if Odysseus indeed represented the first month of an Aries year counted according to one method, his rivals may have represented the first month of an Aries year counted according to other methods.

If we now compare the character of the Telamonian Ajax with that of Odysseus, we may note that in it we meet with nothing of the craft and wiliness which mark that of Odysseus, and on this account, according to our hypothesis, the greater Ajax would more fitly have represented a solar and sidereal, rather than a lunar month. The beginning of such a month was announced obviously, and without recourse to any calculations, and without suffering any variation from year to year, by the heliacal rising of Fomalhaut. This was not the case, as we have noted, with the lunisolar month represented by Odysseus. The observance of the rising of Fomalhaut bound it indeed to the solar year, but for its lunar elements, calculation as well as observation—in mythical language, craft as well as strength—was necessary. Hence it is, I think, that we read in the legend that even in the very stress of his wrestling with Ajax, Odysseus "was not unmindful of his craft," and only thus was he able to resist the strength of his opponent.

To these equal heroes, therefore, Achilles (Fomalhaut at its heliacal rising) announces, "Victory is with both." And later in the bitter and disastrous contest waged by Odysseus and Ajax for the arms of Achilles, again the valour and strength of the combatants was equal, and the prize contended for could only be awarded by taking cognisance of the opinions held by the Trojans as to which hero had wrought to them the greater harm; and here also, according to some writers, the decision given in favour of Odysseus was only obtained by the exercise of crafty wile on his part.

The greater Ajax, then, like Menelaus, symbolised, I am inclined to think, a solar and not a lunisolar month. On the other hand, I would suggest that the lesser Ajax typified the first lunisolar month of the year, counted according to the possible method illustrated in the diagram Plate IX.

The lunisolar year, according to this method, began not like the ancient Accadian year at the new moon most closely following the entry of the sun into Aries, nor like the modern Hindu year at the new moon most closely preceding the entry of the sun into Aries, but it began always at the new moon *nearest* to that event, therefore the lunar month so counted coincided as closely as it was possible for a *lunar* month to coincide with the first *solar* month of an Aries year. If, then, we entertain the two suppositions—that the greater Ajax typified the first solar month of an Aries year, and the lesser Ajax typified such a first lunar month as that illustrated in the Plate—we could understand how it was that the legend represented the Telamonian and the Locrian Ajax as so closely associated that "never at all did Aias, the swift son of Oileus, depart from the side of Telamon," and how the greater Ajax, speaking of himself and his namesake, should be made to say: "We twain shall do battle . . . one in heart as we are in name, for from of old time we are wont to await fierce battle side by side."

But lunar and solar months, however closely bound together, cannot year after year cover exactly the same space of time. The lunar month must, as represented in the Plate, vibrate some degrees from east to west and from west to east, and must during the latter part of its course in many years traverse degrees of Taurus—pushed forward into that constellation by the intercalated thirteenth month.

Bearing these thoughts in mind whilst looking at the diagram we can, I think, understand the imagery of the poem which tells how in the "last part of the course," "Odysseus prayed in his soul to the bright-eyed Athena," who "hearkened to him," and how "when they were now nigh darting on the prize, then Aias slipped as he ran, for Athena marred his race, where filth was strewn from the slaughter of loud-bellowing oxen"; and how with truth Ajax could exclaim: "Out on it! it was the goddess who marred my running, she who from of old like a mother standeth by Odysseus' side and helpeth him." And when we further read in the *Odyssey* that the lesser Ajax "perished in returning smitten in the midst of his ships of the long oars," we may still suspect, looking at the diagram, calendrical imagery; for though in one year—see the ninth of cycle—the sun might traverse the constellation Aries during the whole of the first lunar month, yet in the next year the sun at the beginning of the first month must have been situated 11 degrees to the west of Aries in the monster-haunted constellation Pisces.

Poseidon, we read, "at first" brought Ajax "nigh to Gyræ to the mighty rocks and delivered him from the sea"; but Ajax "let the proud word fall" . . . "he said that in the gods despite he had escaped the great gulf of the sea; and Poseidon heard his loud boasting and presently caught up his trident into his strong hands and smote the rock Gyræan and cleft it in twain, and the one part abode in his place but the other fell into the sea, the broken piece whereon Aias sat at the first when his heart was darkened. And the rock bore him down into the vast and heaving deep, so there he perished when he had drunk of the salt sea water."

In prosaic mood we might recognise the fact that as surely as the month symbolised by Odysseus must at the end of nineteen years of wandering arrive at the first point of Aries, so surely must the month symbolised, as here supposed, by the lesser Ajax have there arrived. But poetical similes are not to be so logically dealt with, and here we must loyally accept the mythic poet's standpoint and think of Odysseus as symbolising the finally and firmly established calendrical year counted according to the above-designated "reformed" calendar.

Many scholars have suspected an astronomic basis for the legend of the Grecian Odysseus and the Latin Ulysses. Their claim has been made partly on astronomic and partly on philological grounds. My absolute ignorance of ancient languages precludes me from any reference to philological arguments, but I cannot help hoping that the suggestions here made that Odysseus symbolised the first month of an Aries year, may be found to fall in with, and thus render more cogent, the arguments of those who point to Odysseus as a "hero who follows the path of the sun and the year."[1]

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[1] *Griechischen und Römischen Mythologie.* W. R. Roscher, column 653. "Hingedeutet ist auf Od(ysseus) als 'Helden auf der Sonnen—und Jahresbahn' schon bei *Creuzer Symbolik*, 3^3, 173 A. 5. Phantastisch, obwohl gedankenreich weitergeführt ist der Gedanke von *Altenburg* (s. o.), *Progr. v. Schleusingen* 1835, 1837: Od. Gang in den Hades ist danach nichts anderes, als dass die Sonne in das solstitium hibernum tritt, wo alle Fruchtbarkeit entschwunden ist. Seine Gemahlin, eine Mond—und Erdgöttin (?), wird bedrängt von 118 Freiern (und deren Begleitern); das sind die 118 Wintertage, die, mit drei multipliziert, das Mondjahr bilden. Aber der Sonnengott Od. erscheint, freilich vom Winter geschwächt, daher in Bettlertracht; er siegt über die Freier und erlöst die Erde vom Winter. Der Meisterschuss durch die zwölf Äxte bezeichnet des Sonnengottes

sieghaftes Vordringen durch die zwölf Monate oder die zwölf Bilder des Tierkreises. Die getöteten Freier werden in den Hades geführt, d. h. die Wintertage verschwinden in der Unterwelt.—Ohne Bezugnahme auf diese allerdings von Zahlenmystik durchsetzte Mythendeutung erkennen doch auch andere kompetente Forscher in Od. einen apollinischen Jahres-oder Sonnengott: *Schwenck*, *Philologus*, 17, 679; *Steinthal*, *Zeitschr. f. Völkerpsychologie*, 7, 82; *v. Hahn*, *Sagwissenschaftl. Studien*, 390*f.* 403*f.*: *Seeck*, *Quellen der Odyssee*, 267*f.*; *Mannhardt*, *Wald-und Feldkulte*, 2, 106; namentlich aber *v. Wilamowitz*, *Homer. Unters.*, 113*f.*; vgl auch *v. Schröder*, *Kuhns Zeitschr.*, 19, 199*f.*; *Beloch*, *Gr. Gesch.*, 1, 100. Ist diese Erklärung richtig, was zu entscheiden nicht dieses Ortes ist, so ist jedenfalls jener der Odysseussage angeblich zu Grunde liegende physikalische Sinn früh in Vergessenheit geraten."

VIII

AGAMEMNON

We have given attention to Paris, the prince specially under the guidance and favour of Aphrodite, and to Achilles, and Odysseus, princes watched over and cared for by Athena. We must now for a short space of time set ourselves to consider what astronomical facts may underlie the story of "the hero son of Atreus, wide-ruling Agamemnon," a prince greatly favoured by Hera.

When Achilles was drawing his great sword from the sheath to slay Atrides, we read that Athena interposed and came down from heaven, "sent forth of the white-armed goddess Hera whose heart loved both alike and had care for them." And we are told that the cities of "Argos and Sparta and of wide-wayed Mycene," ruled over by Agamemnon and Menelaus, were the three cities "dearest far" to Hera.

According to our hypothesis Hera was a goddess presiding over the constellation Aquarius, and was chosen to be the consort of Zeus at a date when at the season of the winter solstice the sun and moon were together in that constellation. We should therefore, as it seems to me, seek to associate in some way Agamemnon with the winter solstice and with the constellation Aquarius; nor is it difficult so to do, for as we have thought of Menelaus, the brother of Agamemnon, as symbolising the solar month during which the sun traversed the constellation Pisces, it is not a far cry to think of Agamemnon as symbolising the solar month during which the sun traversed the adjoining constellation Aquarius: and this it did in the eleventh solar month of a Zodiacal year.

Helen, the sister of Castor and Pollux, was the wife of Menelaus, and we have thought of Helen as symbolising the moon at its first quarter in the constellation Gemini. Clytemnestra, also the sister of Castor and Pollux, was the wife of Agamemnon, and we must now think of her as symbolising the moon — not at its first quarter, but at the beginning of its Trita phase in the constellation

Gemini; for it is a curious, and in this connection an interesting, fact, that just as accurately as the moon at its first quarter marked by its position in Gemini the actual day of the current twelfth solar month of the Zodiacal year, even so accurately did the moon in that constellation at the beginning of its Trita phase mark the actual day of the current eleventh solar month of a Zodiacal year. If the moon at that phase was observed in the first degree of Gemini, it asserted, as it were, the arrival of the first day of the eleventh month. On the other hand, if the moon only attained to that phase in the eastern degrees of Gemini, it showed that the eleventh month had drawn to its close.

To Agamemnon as to a sceptred king no common honour pertained. To him, the chosen leader of the Grecian hosts, Zeus apportioned glory. This honour and glory, according to our hypothesis, was attributed to him as symbolising the first month of a *cosmical solstitial year*. From 3800 B.C. down to 1600 B.C. the season of the winter solstice arrived in the month specially presided over by Hera as the consort of Zeus, a month which was the *eleventh* solar month of the, from of old time established, Zodiacal Aries year.

Now if Achilles is to be thought of as symbolising the heliacal rising of Fomalhaut—which gloriously announced the beginning of that Zodiacal Aries year—we may understand how the legend represented him as in a manner a rival to Agamemnon, and how in the poem he is represented as filled with sensitive jealousy, not easily brooking the indignity of following where he felt himself entitled to lead.

Grecian tragedy has found a text in the long sequence of crime and its inevitable retribution that closely dogged the footsteps of all "Pelops' line." I feel persuaded that the basis of many of these tragic dramas was furnished by traditions, handed down from generation to generation, of observations made of the ominous movement of the solstitial point, at the gloomy midwinter season, through the constellations, and especially of its movement through the constellation Aquarius.

I do not propose here to attempt to follow the clue that astronomy may supply for enquiry into the meanings hidden in the legends concerning

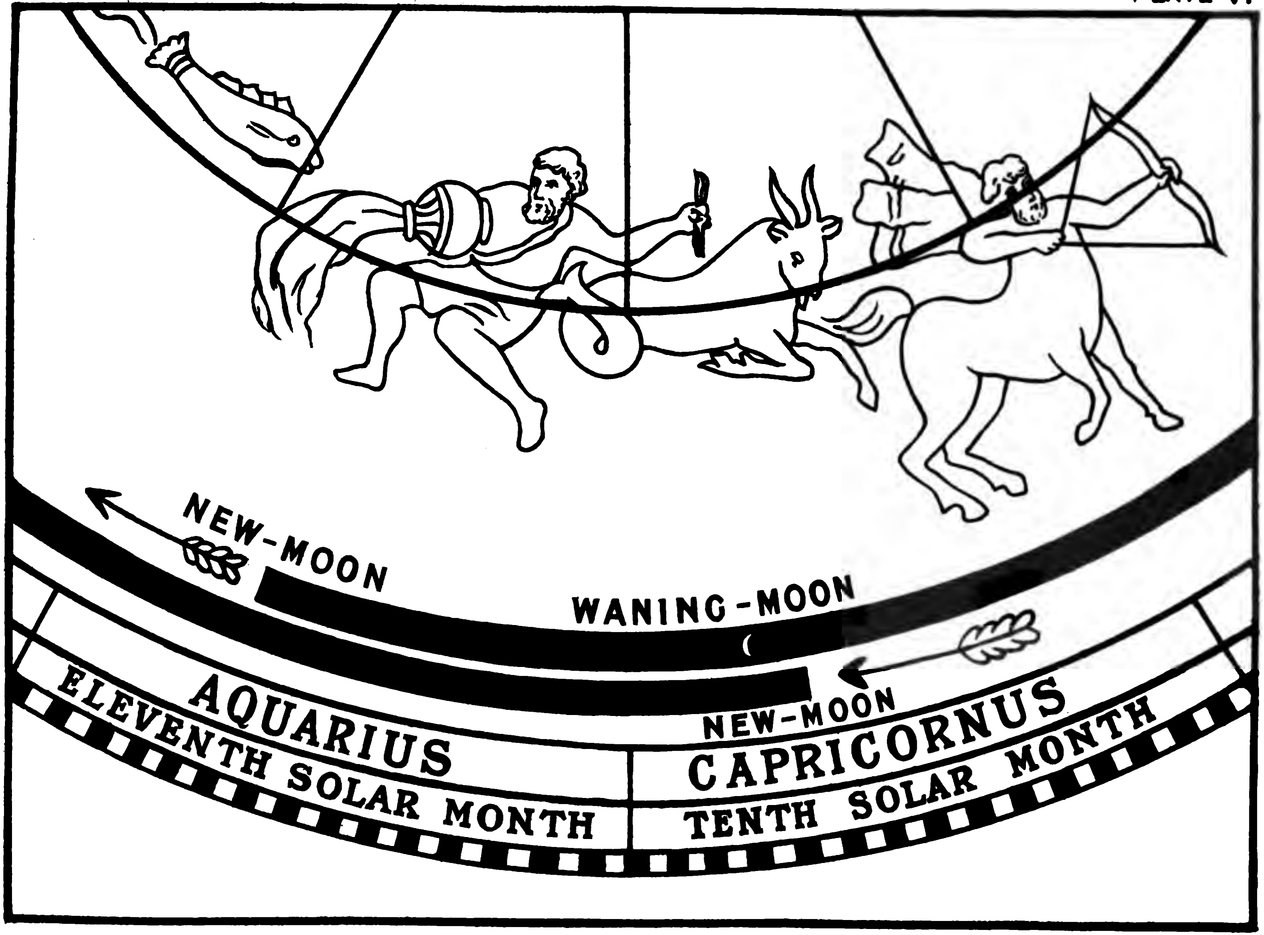
Tantalus, Pelops, and Atreus, but returning to the theme before us, namely, the career of Agamemnon—ending as it does in deeper tragedy than that of any other of the Grecian heroes—we must seek for, and, if it may be, find for it, an astronomic basis.

We read in the *Odyssey* that Ægisthus—a scion of Pelops' line—the lover of Clytemnestra, devised for Agamemnon "an evil end"; and when that hero returned from long absence before the walls of Troy, and set foot with joy upon his country shore, "the watchman spied him from his tower; the watchman whom crafty Ægisthus had led and posted there"; and when the news of Agamemnon's return was brought to him, "Straightway Ægisthus contrived a cunning treason. He chose out twenty of the best men in the township, and set an ambush, and on the further side of the hall he commanded to prepare a feast. Then with chariot and horses he went to bid to the feast Agamemnon, shepherd of the people; but caitiff thoughts were in his breast. He brought him up to his house, all unwitting of his doom, and when he had feasted him, slew him as one slayeth an ox at the stall." When in Hades the shade of Agamemnon in answer to Odysseus' questioning recounts the story of his "evil end," we further read:—"But Ægisthus it was that wrought me death and doom and slew me with the aid of my accursed wife . . . and that shameless one turned her back upon me and had not the heart to draw down my eyelids with her fingers nor to close my mouth. So surely is there nought more terrible and shameless than a woman who imagines such evil in her heart even as she too planned a foul deed fashioning death for her wedded lord."

The Grecian dramatists represent Clytemnestra not only as the confederate of Ægisthus, but as foremost in the dreadful enterprise. They tell us that it was she who set the watchman to spy out the landing of Agamemnon, and that she also sent messengers to meet him and to hasten his return to the arms of his "true wife." Thus she treacherously welcomed him, and decoyed him to a bath, and having inextricably entangled him in a garment—as it were a fish in a net—she struck him to the ground with two blows of a heavy hammer, and with a third blow killed him."

For all this "pitiful work" I would now suggest

PLATE V.



New-moon and waning-moon in Capricornus.

to face p. 151.

the underlying basis of a total solar eclipse of the sun in the constellation Aquarius, and in the eleventh solar month of a Zodiacal year. And first we have a clue to lead us to this opinion in the name Ægisthus, which it is not to be doubted contains reference to a goat. According to our astronomical line of thought this name refers us to the Zodiacal constellation Capricornus, which immediately precedes that of Aquarius. We may think, then, of Ægisthus as symbolising the month during which the sun traversed the constellation Capricornus, or, it may be, as the constellation itself. We must further think of Clytemnestra as symbolising the moon which in some given year arrived at the beginning of its Trita phase at the first degree of the constellation Gemini, and thus announced the first day of the eleventh month and the entry of the sun into the constellation Aquarius. In the same year, and at the beginning of the same lunation, the moon had been new in the constellation Capricornus (see Plate V.), and might have been thought of as even then unfaithful to Agamemnon and conspiring together with Ægisthus to devise an evil end for her wedded lord: for on the twentieth day of that same eleventh month—symbolised by Agamemnon—the moon then again being new, and, as we are to suppose, the node of its orbit being then also situated at the twentieth degree of Aquarius, a total eclipse of the sun must have resulted.

The insistence in the Homeric epic on the accurate number of twenty ambushed men seems to point to this particular date for the eclipse, when the sun, overtaken by the moon, must suffer, in mythic language, "death and doom." The treacherous plotting together of Ægisthus and Clytemnestra may have been thought of as imaging not only the sojourn of the moon at the beginning of its lunation in Capricornus, but also the reappearance at the close of that lunation of its waning crescent (see Plate V.) in the early dawn amongst the stars of that constellation.

In the more horrible version of the legend given by the dramatists Clytemnestra is represented as not only conspiring with Ægisthus against Agamemnon, but as herself the perpetrator of her husband's murder, which is described by them as having been accomplished when Agamemnon was in his bath.

In this version two points of astronomical imagery appear to have been worked upon — namely, the fact that it is the very moon itself which by its interposition between the earth and sun obscures the light of the latter, and the further fact that the eclipse took place, as we have assumed, when the sun in Aquarius might have been thought of as in the celestial waters of that constellation.

We may attribute something of the special gloom and horror that gathered round this legend to the fact—if we have rightly interpreted it—that it mythically chronicled an eclipse occurring at or close to the season of the winter solstice, when a deeper darkness would have been added to the darkest day of the year.

To one other possible astronomic interpretation of mythic imagery connected with an eclipse not of the sun but of the moon I would now direct attention.

An eclipse of the moon not infrequently precedes an eclipse of the sun by an interval of five and a half lunar months. An eclipse of the sun in Aquarius, at or near the winter solstice which, as here suggested, was symbolised by the murder of

Agamemnon, might have been preceded by an eclipse of the moon some fortnight or so after the summer solstice, when the full moon would have been in the western degrees of Pisces, and the sun in the western degrees of Virgo.

At the mid-hour between noon and midnight, that is, at six o'clock in the evening preceding the night on which we will now suppose such an eclipse to have occurred, the figure of "Ophiuchus huge" (the snake-holder) stretched along the meridian line, his hands, as Aratos says, grasping a snake which round the waist

> "Of the Snake-holder twines, but he well fixed
> With each foot presses on a monster huge
> The scorpion, o'er eye and breast scale standing.
> Upright the *Snake* meanwhile in both hands writhing
> Less in the right, most holds the left on high." [1]

So high indeed at that sunset hour did the snake's head threateningly overtop that of its struggling holder that it touched the very zenith. When the sun, in the constellation Virgo, at the close of the long summer day, set in the north-west, the moon, in the constellation Pisces, rose above the south-eastern horizon; and as the night advanced and the stars became visible, the far-reaching constellation Pegasus, the celestial horse, came into view close to and above the full moon. The four most brilliant stars of this constellation mark out a great space of the sky well known to all observers of the stars as "the square of Pegasus." As the celestial horse rose, the figure of Ophiuchus must, hastening on its westward course, decline from the meridian line; and to that line at midnight the full moon amongst the stars of Aquarius would attain, and immediately above it the foremost stars of Pegasus would be visible, where earlier the figure of Ophiuchus stood. It is at that midnight hour we are to suppose that ruinous eclipse overtook the moon.

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[1] *The Phainomena*, etc., ll. 83-87.

If with these phenomena present to our mental vision we read the account given, according to Virgil, by Æneas to Queen Dido and her intently listening court, we can scarcely fail to be struck by many points of resemblance between the astronomical occurrences and the poetic myth.

The story of unutterable woes told by Æneas thus begins:—"The Grecian leaders, now disheartened by the war, and baffled by the fates, after a revolution of so many years (being assisted) by the divine skill of Pallas, build a horse to the size of a mountain, and interweave its ribs with planks of fir. This they pretend to be an offering in order to procure a safe return." Then we read that amongst the Trojans, "Some view with amazement that baleful offering to the virgin Minerva, and wonder at the stupendous bulk of the horse; and Thymoetes first advises that it be dragged within the walls and lodged in the tower." Others advised that it should be destroyed: "The fickle populace is split into opposite inclinations. Upon this Laocoon, accompanied with a numerous troop, first before all, with ardour hastens down from the top of the citadel." He urges the Trojans to put no faith in the horse, and exclaims in the well-known lines: "I dread the Greeks, even when they bring gifts." This said, "with mighty strength he hurled his massy spear against the sides and belly of the monster, where it swelled out with its jointed timbers. . . . And had not the decrees of heaven (been adverse) . . . thou, Troy, shouldst still have stood, and thou, lofty tower of Priam, now remained!"

Then follows the episode of "the treachery and artifice of perjured Sinon," who persuades the Trojans to admit the horse within the walls of Troy. "Here another greater scene, and far more terrible, is presented to our wretched sight . . . lo! from Tenedos (I shudder at the relation) two serpents, with orbs immense, bear along on the sea. . . . They, with resolute motion, advance towards Laocoon; and first both serpents, with close embraces, twine around the little bodies of his two sons, and with their fangs mangle their wretched limbs. Next they seize himself, as he is coming up with weapons to their relief, and bind him fast in their mighty folds; and now grasping him twice about the middle, twice winding their scaly backs around his neck, they overtop him by the head and lofty neck. He strains at once with his hands to tear asunder their knotted spires, while his fillets are stained with gore and black poison: at the same time he raises hideous shrieks to heaven; . . . Then, indeed, new terror diffuses itself through the quaking hearts of all, and they pronounce Laocoon to have deservedly suffered for his crime, in having violated the sacred wood with his pointed weapon, and hurled his profane spear against its sides. They urge with general voice to convey the statue to its proper seat, and implore the favour of the goddess. We make a breach in the walls, and lay open the buildings of the city. All keenly ply the work, and under the feet apply smooth-rolling wheels, and stretch hempen ropes from the neck. The fatal machine passes over our walls, pregnant with arms; boys and unmarried virgins accompany it with sacred hymns, and are glad to touch the rope with their hand. It advances, and with menacing aspect glides into the heart of the city. O my country, O Ilium, the habitation of gods, and ye walls of Troy by war renowned! . . . Meanwhile, the heavens change, and night advances rapidly from the ocean, wrapping in her extended shade both earth and heaven, and the wiles of the Myrmidons . . . and Sinon, preserved by the will of the adverse gods, in a stolen hour unlocks the wooden prison. . . . The towering horse, planted in the midst of our streets, pours forth armed troops; and Sinon victorious, with insolent triumph scatters the flames . . . sable Night hovers around us with her hollow shade. Who could describe in words the havoc, who the deaths of that night? or who could furnish tears equal to the disasters?"

In these and many other lines Æneas renews his griefs and tells how the Greeks overturned the power of Troy. To whatever historical or calendrical event this whole account refers, the imagery contained in the lines I have quoted can scarcely fail to call up to our minds the astronomic phenomena that must have accompanied an eclipse of the moon occurring at the date[1] and season above suggested.

In the horse built to the size of a mountain, at whose immense bulk the Trojans gaze, we may recognise allusion to Pegasus—the celestial horse with "the wings of a falcon and the limbs of a deer,"[2] hymned, as I cannot but believe, in the Rig Veda as an "acceptable offering to the gods"; and the description of Laocoon struggling with the serpents, which "overtop him by the head and lofty neck," will recall to any observer of the heavens the constellation Ophiuchus. The sculptured figure of the Laocoon, according to some authorities attributed to an earlier date than that of Virgil's poem, enforces the thought of the resemblance between the constellation and the Trojan hero (see Plates VI. and VII.), and in comparing the two figures it is difficult to resist the conclusion that the sculptor had present to his view, or to his remembrance, a delineation of the constellation more or less closely resembling that now depicted on a celestial globe: on a celestial globe, and not, as it appears, on the vault of the sky, for on the artificial globe all figures are drawn reversed. If on the sky we look for the constellation, we observe in imagination the left hand of Ophiuchus grasping the high-stretching serpent's neck, as described in the lines quoted above from Aratos, but on the globe it is the right hand and arm that are raised, as is the case in the Laocoon statue, and also in the Pompeian wall-painting which evidently refers to the same event as that described by the poet.

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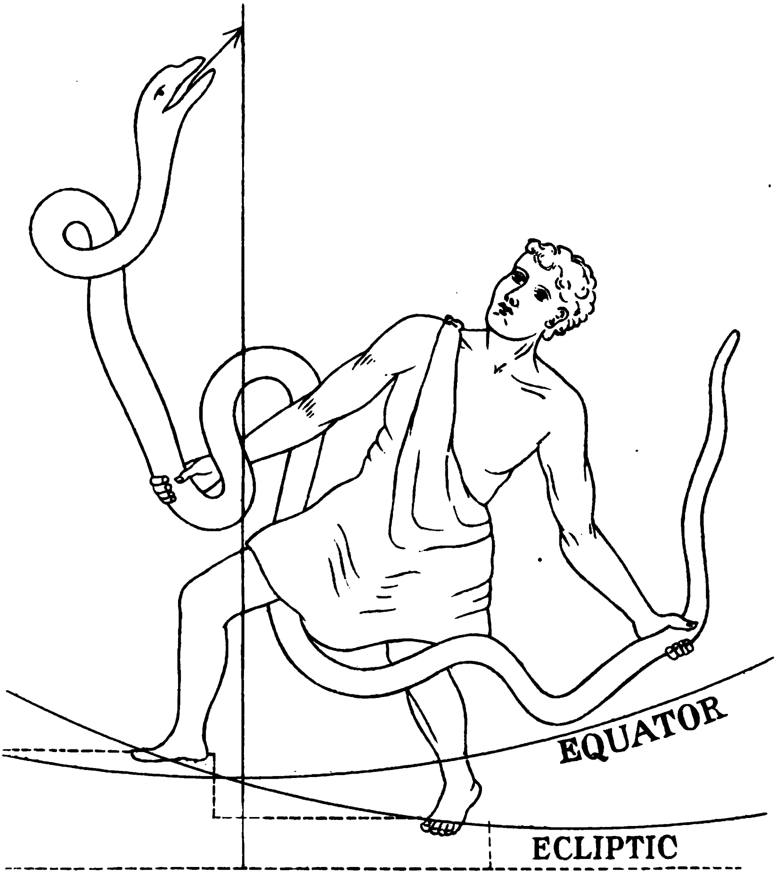
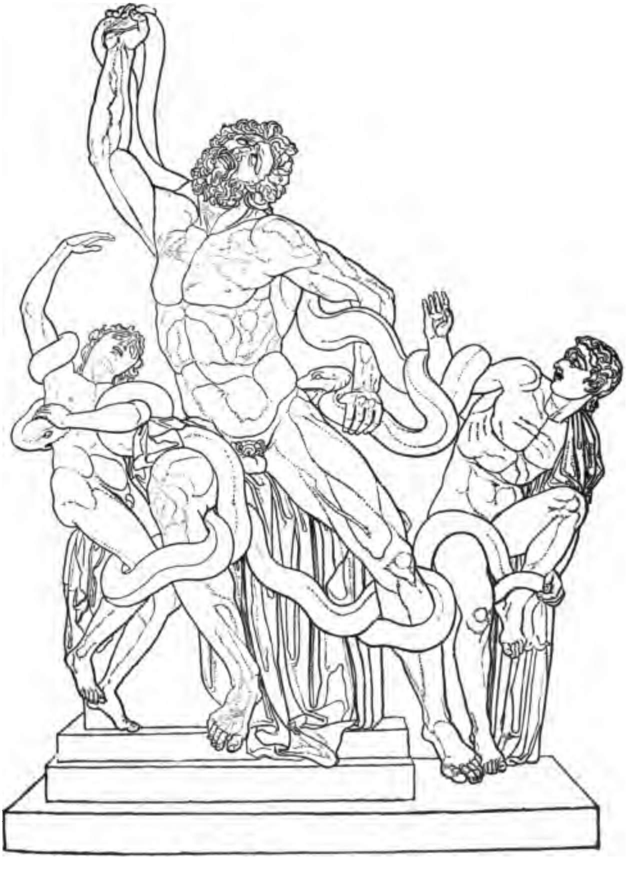
[1] From about 3000 to 2600 B.C.

[2] Rig Veda, Maṇḍala I., Súkta clxiii. verse 1.

These facts may lead us to think that some traditional or conventional representations of



Ophinchus at equinox 3000 B.C.
(drawn from celestial globe).



Laocoon.

Laocoon's struggle with the serpents existed in classic times, on which painters, poets, and sculptors based their separate works. This opinion might further lead to speculation as to how early in the history of science celestial globes formed part of an astronomer's equipment.

It would be indeed hazardous in the state of our present knowledge, or rather ignorance, of the resources of ancient science to do more than speculate on this subject; but it is in this connection an interesting point to note that at 3000 B.C. the line of the equator and the ecliptic crossed each other at such a point as to place the foot of the snake-holder—on the globe the right foot—at just the same degree of elevation above the left, as in the sculptured group the altar step places the right above the left foot of Laocoon.

Ophiuchus, as I have said, was on the meridian as the sun set; and we read in the poem that when the Trojans were first wondering at the stupendous bulk of the wooden horse, Laocoon, whom we have sought to identify with Ophiuchus, was on the "top of the citadel," and, further, that he hastened down from thence; and later we read that the "baleful monster," as we suppose, Pegasus, was dragged up and occupied the position vacated by Laocoon, for it was planted in the sacred city. This, astronomically translated, expresses the fact that Ophiuchus declined from the meridian and at the midnight hour the stars of Pegasus attained to it.

The recital given by Æneas of "the havoc, the deaths, the disasters" of the night that followed the hour, when "the heavens changed and night advanced rapidly from the ocean, wrapping in her extended shade both earth and heaven and the wiles of the Myrmidons," describes mythically, I now suggest, the horrors of an eclipse of the moon occurring at some specially inauspicious moment; and for Troy, a city closely under the protection of Aphrodite, the season of the summer solstice, and very specially the night of the full moon's festival at that season, would have been, according to our hypothesis, above all others inauspicious for such an event.

It has been an anxious but absorbingly interesting task to me to attempt, as I have attempted, to suggest to classical scholars possible astronomical interpretations of legends familiar to them from their early days, and read and enjoyed by them in the harmonious verse and prose in which they were originally recounted.

I have only been able to stumble on, leaning on the support of translations and commentaries. On this plea I claim an indulgent hearing as regards my treatment of the legends; but I cannot help feeling a strong hope that some scholars who may have had the patience to listen to the suggestions here proposed may feel inclined to push enquiry further, and from the many sources of information closed to me but within their easy reach, may be able to confirm and greatly to extend any of the astronomic interpretations of classic myths here given which may prove to have been correctly imagined.

APPENDIX

THE "STAR OF STARS" AND "DILGAN"

[Reprinted from the *Proceedings of the Society of Biblical Archæology, January*, 1906]

"WHEN on the first day of the month *Nisan* the star of stars (or Dilgan) and the moon are parallel, that year is normal. When on the third day of the month Nisan the star of stars and the moon are parallel, that year is full."

This translation of an Accadian tablet was contributed to the *Monthly Notices of the Royal Astronomical Society* (vol. xxxix. p. 455) by Prof. Sayce and Mr Bosanquet; and in a very interesting dissertation on the text they explained how, by observing whether the "star of stars" set at the same time as the new moon on the *first* or not till the *third* day of Nisan, it was possible for Accadian astronomers to determine whether in the current year it would or would not be necessary to intercalate a thirteenth month in their soli-lunar calendar, in order to keep the year true to the length of the sun's revolution through the stars.

The writers tell us that "Dilgan," a star referred to in other cuneiform inscriptions, "is to be identified with the 'star of stars' of the rule by a passage in an unpublished tablet which makes the 'star of stars' equivalent to 'the star Dilgan of Babylon,'"[1] and they proposed to identify Dilgan with the bright conspicuous star Capella, in the constellation Auriga.

Mr Maunder has lately again called the attention of astronomers, in the *Monthly Notices of the Royal Astronomical Society* (March, 1904), and in the *Journal of the British Astronomical Association* (vol. xiv., No. 6), to this Accadian tablet.

In these Papers he makes it very clear that two conflicting theories have been propounded by Assyriologists in regard to the Accadian calendar. The two theories are, firstly, that the Accadian year was equinoctial; secondly, that the successive constellations of the Zodiac were connected with the successive months of the year, Aries being the leading sign.

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[1] *Notices of the R.A.S.*, vol. xl. p. 120.

Many years ago, in this Society's *Proceedings*, I drew attention to the fact that these two theories conflicted with each other, and I contended that, as between their conflicting claims, the evidence of the tablets appeared to be strongly in favour not of an ancient Accadian year counted from the vernal equinox, but of one counted from the entry of the sun into the constellation Aries.

To this view Mr Maunder is strongly opposed, and he quotes the tablet which heads this Paper as one which, if it has been rightly understood, must render the theory that in ancient times Aries led the year utterly untenable.

He observes: "If Capella was Dilgan, the sun must have been passing through the constellation *Taurus* during the whole of the first month of the year, so that if any connection between the signs of the Zodiac and the months of the year was then recognised, the *Bull* must have been regarded as the first sign, and the *Ram* as the last."

Now it must not be thought that these questions concerning the precedence of the Ram or of the Bull in ancient zodiacs are of merely astronomic or academic interest. It cannot with truth be denied that the answers to many historical and mythological problems are closely dependent on those given to such astronomic enquiries, and it is for this reason that I venture to bring before the notice of this Society the subject of the tablet translated by Prof. Sayce and Mr Bosanquet, and their identifications of the "star of stars" with "Dilgan," and of "Dilgan" with "Capella."

In this enquiry it will be best to deal first with one of these identifications exclusively, namely, that of Dilgan with Capella, and afterwards to discuss whether the "star of stars" can with certainty be equated either with Dilgan or with Capella.

Mr Maunder thus sums up the considerations which led Prof. Sayce and Mr Bosanquet to recognise in Dilgan the star known to us as Capella. He says: "They identified *Dilgan*, the 'star of stars,' with *Capella* by means of a tablet in the Semitic language, which reads:—

"'The appearance at the beginning of the year of the star *Icu* [Dilgan] . . . one observes.'

"And again:—

"'The star *Icu* in the month Nisan was seen.'

"These they take, and no doubt correctly, as being observations of the heliacal rising of *Capella*, and they point out that it rose heliacally at the time of the spring equinox about 2000 B.C., and further that its heliacal rising took place before its heliacal setting. These observations they join with the foregoing as together furnishing the determination of the beginning of the year."

It will be seen, from this summing up, that the identification of Dilgan with Capella was based on two assumptions, namely:—

First, that the heliacal rising of Dilgan (Capella) had been chosen by Accadian astronomers as a mark of the beginning of the year at about 2000 B.C.

Secondly, that the year so marked by Dilgan (Capella) was one beginning at the spring equinox.

When Prof. Sayce and Mr Bosanquet put forward their claim for the identification of Dilgan with Capella, both the above assumptions, though not actually capable of proof, were yet not unreasonable.

The earliest known Accadian astronomic tablets were then attributed to a date of about 1600 B.C. To hold that the observations recorded in them had been made some four hundred years earlier must have been deemed a sufficently hazardous supposition. Again, as history showed that at about the beginning of our era, Nisan, the first month of the Babylonians and of the Jews, fell close to the spring equinox, the opinion that in past times these nations had counted their years as beginning at that season was very generally if not universally accepted.

Now, however, that we know that many astronomical observations had been made and recorded long before 2000 B.C., it is impossible to restrict the age of the two references to the star Dilgan in the quoted tablets to that date, and hence the argument for identifying Dilgan with Capella, even admitting the equinoctial theory for the Accadian year, is considerably weakened; and it has further to be borne in mind that two conflicting theories on the subject *do* exist, and that it is not yet a proved fact, or one that can be treated as an axiom, that the Accadian year was equinoctial.

As then there must still prevail much uncertainty regarding the identification of Dilgan with Capella, it will be worth our while to call to our aid in this enquiry some notices of Dilgan occurring in other Accadian tablets, which may enable us to determine in what part of the celestial sphere the star (or constellation) Dilgan was situated.

The translating of ancient astronomical tablets has presented almost insurmountable obstacles to scholars; for as Prof. Sayce observes:—

"Their interpretation is for the most part difficult, since not only are the terms obscure and removed from ordinary life, but a large portion of the tablets is written ideographically. The astrological information they contain had to be concealed from the uninitiated, and accordingly while the grammar is Semitic, the words are in great measure Accadian. Sometimes, however, these are Assyrian; and the mixture of the two vocabularies considerably increases the difficulty of decipherment, as it is often uncertain whether the characters are to be read phonetically or not. Moreover, the same ideograph is not infrequently used in totally different senses; in fact we may say that whereas an ordinary Assyrian inscription endeavours to make itself intelligible to the reader, these astrological legends are intended to conceal their meaning as much as possible."

In the thirty years which have elapsed since

Prof. Sayce wrote these lines some advance has been made towards the right understanding of cuneiform astronomical tablets. The advance has been slow; but when we take into consideration the difficulties which had to be encountered at every step of the way, we can only congratulate ourselves on what has been accomplished by the scholars who have turned their attention to this arduous task.

It is now possible to claim with certainty a knowledge of many Accadian technical terms which were still made use of in astronomic and astrologic documents by Babylonian writers in the first and second centuries B.C. The same claim can be made for our knowledge of the Accadian names for the seven planets, and of the first syllable, at least, of the twelve constellations of the Zodiac. The Accadian names of a few extra-zodiacal stars and constellations have also been securely ascertained; but for Dilgan, so far as I have been able to learn, no more certain identification has been proposed than that, as above stated, suggested by Prof. Sayce and Mr Bosanquet.

By making use, however, of the knowledge that has been gained of the names of other stars and constellations, I think it will be possible to suggest an identification for Dilgan with a well-known ancient constellation in the Grecian sphere.

Recorded observations of the position of the planet Venus in different months of the year are to be met with in many ancient tablets. Prof. Sayce translates as follows a passage in which Dilgan is associated with the planet Venus in the month Sebat:—

W.A.I. 53:—

"24. [In the month Chisluv] Venus is called the spark of Gula.

"25. In the month Tebet, Venus is the spark of the double ship.

"26. In the month Sebat, Dilgan of Babylon.

"27. A royal crown it *gives* (?) to Merodach.

"28. In the month Adar the spark of the Fish of Hea is Venus (and also Mercury).

"29. In the month Adar on the third day (Venus) rises and in Nisan. . . ."

Fortunately for our enquiry concerning Dilgan, with which in this tablet the planet Venus is associated in the month Sebat, we can claim with almost certainty a knowledge of the names of the two constellations which in the tablet appear as marking the path of the planet in the two preceding months. Gula, it is scarcely possible to doubt, designated the zodiacal Aquarius; and Uz, formerly translated "the double ship," is now translated "Goat," and stands astronomically for the zodiacal Capricornus.

The apparent path of the planet Venus is, as a rule, from west to east amongst the constellations; but for about a fortnight before and a fortnight after inferior conjunction with the sun its path is from east to west. When, therefore, we read that "In the month Chisluv Venus is called the spark of Gula" (Aquarius), and that in the following month, Tebet, "Venus is the spark of the double ship" (Capricornus), it is clear that at some time during those two months Venus was moving in a retrograde direction through the constellations, and that either at the end of Chisluv or the beginning of Tebet the planet was in inferior conjunction with the sun.

The accompanying illustration represents what may have been the zigzag path of Venus in a year, in which the longitude of the planet coincided with that of the sun at a point on the ecliptic between the Babylonian constellations Gula and Uz.

It is not by any means contended that the Babylonian constellations bore in every case exactly the same *figures* as those represented on the Grecian sphere—though there can be no doubt that in many instances a close resemblance did exist. The illustration[1] points to the fact stated by Epping and Strassmaier, that for purposes of astronomical measurement "jedem Bilde genau 30° zugetheilt werden."

As to the initial point of their zodiacal series, I have adopted that of the fixed Hindu sphere. The many considerations which have led me to the opinion that not only in India but amongst "the ancients" generally this was held to be the initial point of the ecliptic circle, I have dwelt upon in *Ancient Calendars and Constellations.* Epping suggests a point about 5 degrees to the east of that here given for the 1 degree of Aries. This difference, though enough to affect the answer given to many chronological problems, need not be taken into consideration in our present enquiry concerning the position of Dilgan in the Accadian sphere.

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[1] See Plate XIV.

As the Babylonian years were soli-lunar, the position of the sun on the first of a given lunar month might vary to the extent of about 29 degrees in relation to the constellations of the Zodiac. I have supposed that the year in question followed one in which a thirteenth month had been intercalated, and that the first of Chisluv occurred when the sun had advanced about 20 degrees through the Babylonian constellation of the Archer.

During Chisluv, the path of Venus, as may be inferred from the tablet, was through the stars of Gula (Aquarius), and in the following month Tebet through the stars of Uz (Capricornus), therefore in the beginning of the month Sebat the planet would traverse some of the eastern degrees of Uz, and later in the same month would again enter into the constellation Gula. The tablet, however, associates Venus in the month Sebat not with Uz or with Gula, but with "Dilgan," and this fact should lead us to the conclusion that Dilgan was a star or constellation not far from the point on the ecliptic where the constellations Capricornus and Aquarius meet.

Now Capella—the star with which, as we have seen, it has been proposed to identify Dilgan—is distant by more than 95 degrees of longitude from this point. If, therefore, we place any reliance on the statement made in the tablet concerning the planet Venus in the month Sebat,[1] we must dismiss the suggested identification of Dilgan with Capella, and we must seek for some star or constellation worthy of notice in or near to Capricornus and Aquarius which could have marked the path of Venus in Sebat, and which also should fulfil the astronomical requirements demanded of Dilgan in the other ancient tablets already quoted, namely :—

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[1] Robert Brown, in "Primitive Constellations," vol. ii., p. 150, refers to a "Dilbat" (Venus) tablet as follows :—

"The tablet 81.7.6, 102, for acquaintance with which I am indebted to Mr Pinches . . . gives, but singularly enough not quite in their regular order, the 12 months with 12 special stars. . . . " At a later page Mr Brown gives a translation of the tablet. I quote from it the lines referring to Dilbat (Venus) in the months Chisluv, Tebet, Sebat, and Adar :—

"7. The Star Gir-anna = Dilbat in Kisluv."
"8. The star Uz = Dilbat in Tebet."
"9. The star Dilgan = Dilbat in Sebat."
"10. The star Kha (the Fish) = Dilbat in Adar."

Gir-anna, not Gula, is here associated with Venus in the month

"The appearance at the beginning of the year of the star Dilgan . . . one observes."

And—

"The star Dilgan in the month Nisan was seen."

To find at 2000 B.C. a star or constellation in the vicinity of Capricornus and Aquarius whose appearance should announce the arrival of the sun at the equinoctial point (then very close to the Pleiades group), it would be necessary to fix upon some star or constellation in *quadrature* to the sun, which star rising at midnight might have called attention to the fact that the sun was at the equinoctial point. That Accadian astronomers should have thus elected to mark the beginning of the year, is a possible but somewhat far-fetched supposition, and to the advocates of an equinoctial year — counted by methods first

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Chisluv; but for the following three months the path of the planet in both tablets is marked by the same stars or constellations. It has occurred to me that possibly Gir-anna may have been another Accadian name for the constellation "Gula," and if that were the case, we might assume that the two tablets described the path of the planet in one and the same year; but be that as it may, we find Dilgan in both tablets marking the path of Venus in the month Sebat. The position of Dilgan as in the vicinity of Uz is thus assured by the testimony of two independent witnesses.

originated about 2000 B.C.—must be left the task of identifying Dilgan under such a supposition.

If, on the other hand, we adopt the theory of an Accadian sidereal year, dependent on the entry of the sun into the constellation Aries, we should not find any great difficulty in identifying Dilgan with a well-known ancient constellation which could have been associated with Venus in the month Sebat, and which also by its heliacal rising might for Accadian and Babylonian astronomers have marked the arrival of the sun at the initial point of the Zodiac. This constellation is the one known to us as Piscis Australis—the Southern Fish.

It will be seen from the illustration that this constellation lies to the south and to the west of Aries, and that it underlies the constellations Aquarius and Capricornus.

A little reflection will, I think, convince us of its suitability for identification with Dilgan.

I have claimed that the heliacal rising of the Southern Fish might for Accadian and Babylonian astronomers have marked the arrival of the sun at the initial point of the Zodiac.

The late Mr F. C. Penrose, in a paper published in the *Transactions of the Royal Society* in 1893,[1] thus explains and discusses the meaning of the term "heliacal rising." He says, p. 43, ". . . . the meaning of the term being that the star, when very slightly above the horizon, should just be visible in the twilight, before being extinguished by the dawn."

And further, p. 44:—

"The conclusion I have come to is that (1) a first magnitude star in fair average weather in Greece or Italy could be seen when rising heliacally at an altitude of 3 degrees, the sun being 10 degrees below the horizon; (2) that second magnitude stars should require an altitude of 3 degrees 30 minutes with the sun 11 degrees depressed, but that for a third magnitude star the sun's depression should not be less than 13 degrees. . . . "

In the illustration (see Plate) I have adopted as an approximate limit of visibility a circle—having the sun as its centre—of 13 degrees, and I have thus attempted to show the relation of the sun, at the initial point of the Zodiac, to the horizon line of an observer in the latitude of Babylon, just as the whole constellation of the Southern Fish surmounted that line, at the dates in round numbers of 2000 and 3000 B.C. I have also drawn the horizon line for Fomalhaut—the very conspicuous star of the first magnitude at the mouth of the Fish—and given its circle of visibility when the sun was 8 degrees to the west of the initial point of the Zodiac.

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[1] "On the Orientation of certain Greek Temples and the Dates of their Foundation derived from Astronomical Considerations, being a Supplement to a Paper on the same subject published in the *Transactions of the Royal Society* in 1893."

According to Mr Penrose's observations quoted above, the dotted circle of 13 degrees given as the circle of visibility would suit for that star[1]; though for the fainter stars in the head of the Fish a wider circle ought to be allowed. I have, however, given the same extent to the circles in each case, as it is not indeed possible, not knowing what were the methods pursued, nor what were the powers of observation possessed by Accadian astronomers, to give more than a rough approximation to what they would have calculated as the limit of visibility of a star rising heliacally.

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[1] To avoid a multiplicity of lines, the 3 degrees for the altitude of the star and 10 degrees of depression for the sun have been combined in one circle.

Granting, however, these uncertainties of detail, it may be inferred from a study of the illustration that the Southern Fish rose heliacally when the sun attained to the initial point of the Zodiac at a date nearer to 3000 than to 2000 B.C.

In such a year as that represented in the illustration the constellation during the month Tebet would have been invisible, lost in the overpowering light of the sun, which in that month traversed parts of the constellations Aquarius and Capricornus. Early in the month Sebat the westernmost stars of the Southern Fish would begin to be visible just before sunrise; but not till some date in Adar would the whole constellation rise visibly above the horizon line, the sun then having arrived at the initial point of the Zodiac.

It has been a comparison of the tablet, which described the planet Venus as the spark of Dilgan in the month Sebat, with other tablets, which referred to Dilgan as worthy of observation at the beginning of the year, which has given, as it seems to me, a reasonable ground for suggesting that Dilgan was the Accadian name of the Southern Fish; and it further seems to me possible to detect in the Venus tablet, at lines 28 and 29, a reference to the heliacal rising of the bright star Fomalhaut:—

"28. In the month Adar the spark of the Fish of Hea is Venus (and also Mercury).

"29. In the month Adar on the third day (Venus) rises, and in Nisan . . . ."

The Fish of Hea, in line 28, refers probably to the zodiacal constellation Pisces, to the westernmost degrees of which the planet attained at the close of the month, though as we do not yet know definitely by what names Accadian astronomers distinguished from each other the many fish and marine monsters represented on the celestial sphere near to the constellation Aquarius, it is not possible to feel quite sure whether reference is not still here made, under another name than Dilgan, to the Southern Fish, near to which the path of the planet lay during the greater part of the month Adar.

However that may be, it is to the words "and also Mercury, etc. . . . ," that I wish to direct attention. At the date when the above translation of the Venus tablet was made, the Accadian name of the planet Mercury had not been correctly ascertained; the words "(and also Mercury)" are in brackets, and may be looked on as a provisional translation, and the same may be said of the word "(Venus)" in line 29.

If instead of these suggested renderings we might think that the word translated "Mercury" really designated the star Fomalhaut, we might read the two lines as follows:—

"28. In the month Adar the spark of the Fish of Hea is Venus . . . Fomalhaut.

"29. In the month Adar on the third day rises . . . ."

The appearance of Fomalhaut on the 3rd of Adar, after its long period of invisibility, would have been a noticeable phenomenon, whereas Venus had for more than a month been a glorious object in the eastern sky, and the planet for some months to come would still continue to appear, but with diminishing lustre, as a morning star.

If the reference is to Fomalhaut, it would furnish us with a clue by which it might be approximately determined what was the latest date at which the observations recorded in the tablet could have been made.

In such a year as that dealt with in the illustration, the month of Adar, it is assumed, had by intercalation in the preceding year been pushed forward to its furthest limit in the Accadian calendar; yet even in such a year Fomalhaut could not have risen visibly on the 3rd of Adar at a date much later than 3000 B.C. If, however, the conjunction of Venus recorded in the tablet took place, as possibly might have been the case, in a year when the months had not been pushed quite so far forward amongst the constellations, the observation of the heliacal rising of Fomalhaut on the 3rd of Adar might have been made at a much higher date than 3000 B.C.

The clue obtained, therefore, would give us the latest possible, but not the earliest possible date for the recorded observation.[1]

Without laying much stress on these speculations concerning the rising of Fomalhaut on the

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[1] It must, however, be pointed out that if the initial point of the Zodiac proposed by Epping and Strassmaier is the correct one, the above suggeste dates must be lowered by about 1000 years.

3rd of Adar, but returning to the main proposition here made, that Dilgan was the Accadian name of the constellation of the Southern Fish, and trusting to the strong probability that in very early ages, and still on into Babylonian times, the heliacal rising of its stars announced the approach of the calendrical new year, I am led to think that the legend of the "Monstrous Oannes" handed down to us by Berosus, embodied not an historical but an astronomical myth, that it did not refer at all to the conquest or civilisation of Babylonia by a race of men arriving from the south in ships, but to the heliacal rising of Dilgan. Berosus tells us:—

"There was originally at Babylon a multitude of men of foreign race who had colonised Chaldea, and they lived without order like animals. But in the first year there appeared from out the Erythrean Sea, where it borders upon Babylonia, an animal endowed with reason, who was called Oannes. The whole body of the animal was that of a fish, but under the fish's head he had another head, and also feet below, growing out of his fish's tail, similar to those of a man; also human speech, and his image is preserved to this day. This being used to spend the whole day amidst men, without taking any food, and he gave them an insight into letters, and sciences, and every kind of art; he taught them how to found cities, to construct temples, to introduce laws and to measure land; he showed them how to sow seeds and gather in crops; in short, he instructed them in every thing that softens manners and makes up civilisation, so that from that time no one has invented any thing new. Then when the sun went down this monstrous Oannes used to plunge back into the sea and spend the night in the midst of the boundless waves, for he was amphibious."

For dwellers in Babylonia, and especially for those at the mouth of the Euphrates, the constellation of the Southern Fish rose, as it were, out of the Erythrean Sea. Fomalhaut, by far its most conspicuous star, rose about 35 degrees east of south.

At the season when Fomalhaut rose *heliacally* it might well have been thought of as accompanying the sun, and therefore as "spending the whole day amidst men." When the sun went down Fomalhaut did not indeed "plunge back into the sea," but it was no longer above the horizon, and morning after morning for many days it would again and again rise out of the Erythrean Sea. But further, if the season marked by the appearance of Fomalhaut in the early dawn was that, as I have suggested, of the beginning of the Babylonian calendrical year, there is no difficulty in understanding how so many beneficent acts were attributed to the divine "being" who, rising out of the Erythrean Sea, heralded the advent of the most auspicious of all days, the first of the new year.

This ancient Oannes legend has been handed down to us in a language foreign to the country in which it first took shape, and it may be that instead of the words "in the first year" we should read "on the first of the year," and so reading the passage we should, I think, easily recognise in the being who appeared on the first of the year, and whose whole body was that of a fish, the constellation Dilgan, the Southern Fish.

If now we adopt the opinion that Dilgan was the Southern Fish, we have still to enquire how this opinion must affect the answer to be given to the question of the identity of the "star of stars" with Dilgan or with Capella.

And as to its equation with Dilgan the answer, either on the equinoctial or the zodiacal theory, must be in the negative.

The star of stars "of the rule" was, as we have learned, to be observed *setting* together with the new moon at the beginning of the month Nisan, the first month of the year; it must therefore have followed and not preceded the sun during that first month.

According to the equinoctial theory the sun 2000 B.C. during the first month of the year traversed the constellation of the Bull, and according to the zodiacal theory the constellation of the Ram. But when the sun was in either of these constellations the *setting* of the Southern Fish could not have been observed, as it *preceded* and did not *follow* that of the sun.

The first month of a year announced by the setting of the new moon together with the Southern Fish must have been a month during which the sun traversed parts of the constellations Sagittarius and Capricornus, and one which in Babylonian times must have fallen in the late autumn.

If, therefore, Dilgan was the Southern Fish, it could not have been the star of stars "of the rule"; and we are thus brought face to face with a discrepancy between the evidence of the Venus tablet above considered, on which the identification of Dilgan with the Southern Fish was based, and with that of the unpublished tablet referred to by Prof. Sayce and Mr Bosanquet, on which the identity of Dilgan with the "star of stars" was based.

But it has been admitted, and it must still be admitted, that very many difficulties and apparent discrepancies are to be met with in the study of the obscure astronomical tablets. Further research on the part of Assyriologists will no doubt result in the reconciling of many such discrepancies; meanwhile, for those who hold that the Accadian calendar was zodiacal, there can be no doubt that the astronomical probabilities are in favour of the identification of Dilgan with the Southern Fish, and not of that of Dilgan with Capella.

The claim for the identification of the star of stars with Capella, disencumbered of its equation with Dilgan, still remains, but can only be based on the assumptions that the Accadian year was equinoctial, and the date of the origin of "the rule" was not earlier than 2000 B.C.

But, as I have pointed out before, it is not possible to assume either of these propositions as axioms; and if the arguments in favour of Dilgan being the Southern Fish are accepted, the proposition that the Accadian year was equinoctial will appear scarcely tenable.

With increased confidence, therefore, in the zodiacal as opposed to the equinoctial theory, I now venture to suggest a quite different identification for the star of stars than that of Capella.

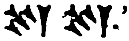
In pursuance of this object we have to enquire: Is there any very conspicuous star, or group of stars, which might worthily have been chosen by Accadian astronomers to mark by its seleniacal setting the beginning of a year dependent on the sun's entrance into the constellation Aries? The answer to this question lies at our very hand.

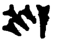
There is, I think, in the heavens no star or asterism which more easily attracts the attention and admiration of even the most casual star-gazer than does the Pleiades group; that—

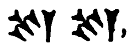
> " . . . . swarm of fire-flies tangled in a silver braid."

In all lands and in all literatures the "sweet influences of the Pleiades" have been sung.

This group of stars not only at 2000 B.C. but during all the ages of Accadian and Babylonian history could have served, and, indeed, down to the present day might still serve, to determine, according to the method described in the tablet, the length of solilunar years whose beginning was fixed at the initial point of the Accadian Zodiac.

I have not been able to ascertain what are the cuneiform signs which stand in the tablet for the "star of stars," nor in what way those signs are transliterated; but it has struck me that the name of the Pleiades, or rather of the brightest star in that group, the Pleiad, as it is given by Epping and Strassmaier in the *Zeitschrift für Assyriologie* (1892), might bear a meaning not very dissimilar to that of the "star of stars." At pp. 224 and 225 a list is given of thirty-three important stars, the positions of which have been definitely ascertained. The name of the Pleiad there appears as "Temennu ."

On another page of the same paper (251) the writer draws attention in a footnote to the fact that according to Jensen the sign  may be transliterated as " Mulu " or " Kakkabu," words which I observe are often elsewhere translated as star or stars.

I am quite ignorant of cuneiform writing, Accadian or Assyrian, but what seems to me the strong astronomical probability that the Pleiades or the Pleiad was "the star of stars" of the rule, has led me to think, or at least to hope, that the name of the " star of stars " of the tablet may have been rendered in the Babylonian tablets studied by Epping and Strassmaier by the signs , and that those signs transliterated Te-te might bear the meaning of "star, star," " stars," or "star of stars."

If Assyriologists do not forbid these renderings of the Babylonian name of the Pleiad, and if it should be granted that the tablet quoted at the head of this paper contains an ancient Accadian observation of the simultaneous setting of that star and of the new moon of the month Nisan, then the case for an Accadian sidereal year as opposed to an Accadian equinoctial year must, I think, be considered as very firmly established, and thus a point of vantage will have been gained for the elucidation of many other astronomical, chronological, and mythological problems.

EXPLANATION OF PLATES VIII., IX., X.

THE black, white and grey bands, arranged in vertical order beneath the ecliptic line, show the degrees of longitude traversed by the sun (on the ecliptic) during the first and last lunar months of twenty successive lunisolar Aries years.

The white bands show the longitude of the sun in the *first* months of those years.

The black bands show the longitude of the sun in the thirteenth month of any embolismic year, in which the added month was intercalated at the close of the year.

The black bands dotted with white show the longitude of the sun in the last month of any embolismic year, in which the added month was intercalated, not at the close, but in the middle, of the year, *i.e.*, after the sixth month.

Small arrows point to the westernmost and to the easternmost positions of the full moon, in the constellations opposed to the sun, in the thirteenth and in the first months of the cycle of years here represented.

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